

THE IRON AGE

PRODUCTION -- MANAGEMENT

JANUARY 18, 1934

PROCESSES -- NEWS

THIS RELIABLE BUSINESS BAROMETER POINTS UP

★ Because it carries the largest and broadest volume of industrial advertising. The Iron Age advertising volume has for over fifty years forecast the major trends of business. ★ The Iron Age advertising trend line started upward again in the middle of 1933 and has steadily continued to rise. In the last six months 58 companies have entered new advertising contracts or increased former contracts. The total amount of new space involved is 535 pages. ★ Circulation is rising. New subscriptions (exclusive of paid renewals) totalled 1,744 for the second half of 1933. The net result is a gain of 5 per cent in circulation since June which added 2,000 more readers. ★ And what is most significant is that the percentage of subscriptions renewed has risen from 64.66 per cent in 1932 (the low point) to 78.56 per cent in the second half of 1933. All these renewals and new subscriptions are paid for at \$6 per year.



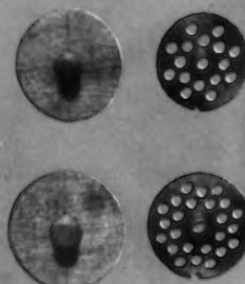
DIRT · BEER · SAUSAGE.



Steel Beer Barrel



Electric Vacuum Cleaner



Patterns and Finished Hamburger Plates

Could any articles be farther removed from each other than beer and sausage on the one hand, and dirt on the other? Yet, in the making and the distribution of the two former, and in the disposal of the latter, our alloy tool steels, cast to shape, play an important part.

For example, our steels are largely used for drawing rings for steel beer barrels—for the actual grinding plates of sausage-making machines—and for blanking and forming dies for the component parts of electric vacuum cleaners.

Our complete line includes Krokoloy, Martin Steel, and Castaloy—all alloy tool steels, cast to shape and hardened in still air—and Carbomang, an oil-hardened tool steel, cast to shape. Whatever your need, one of our steels will meet it.

Our engineers will be glad to cooperate with you without obligation in working out your die designing and machine tool problems. Write for copies of our specialized booklets covering the application of each of these steels.

DETROIT ALLOY STEEL COMPANY

Foot of Iron Street



Detroit, Michigan

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THE IRON AGE January 18, 1934

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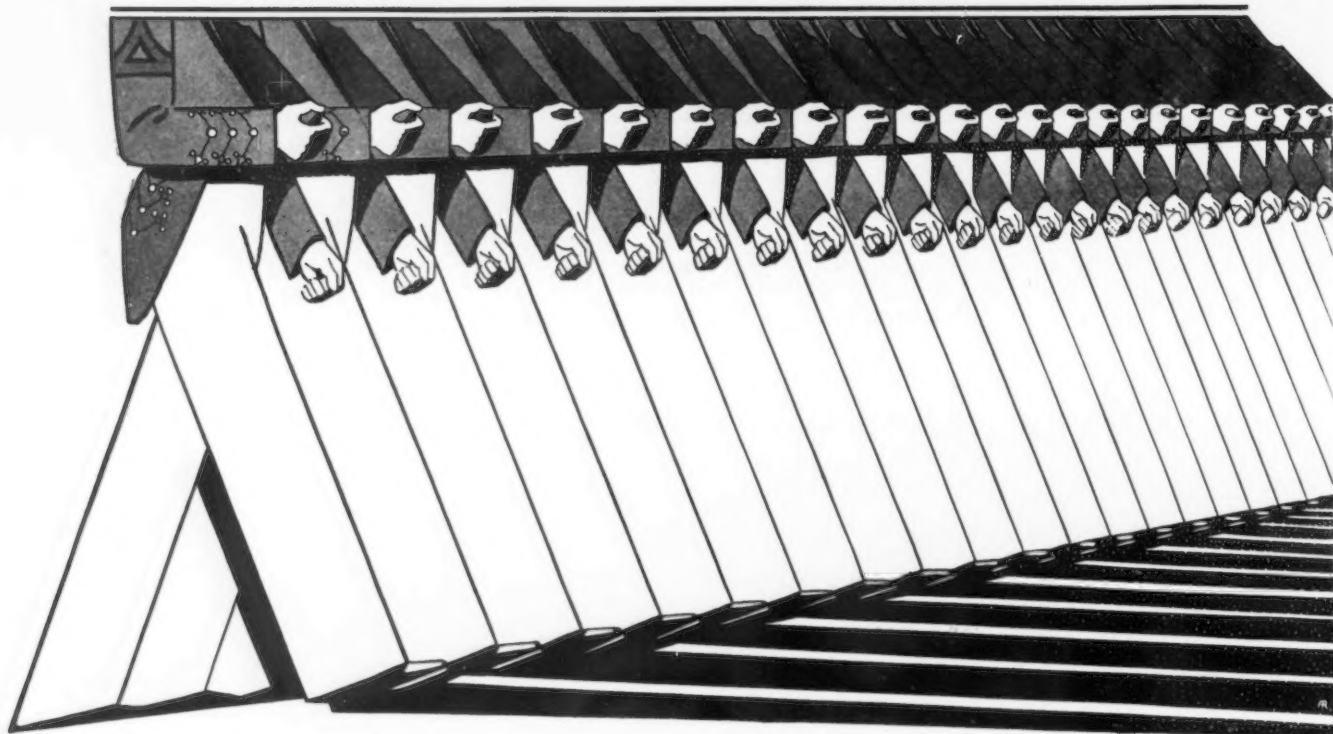
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SEVENTY-NINTH YEAR OF SERVICE TO THE METAL WORKING INDUSTRY

LOOKING FOR UNIFORMITY



IN GEAR STEEL?

To take heat-treatment properly, without frequent changes in the treating cycle, gear steel must be uniform.

We operate extensive heat-treatment facilities of our own and heat-treat a substantial part of the production of our alloy steel plant. Our metallurgists and steel makers thoroughly appreciate the need for the utmost uniformity in steel that has to

be heat-treated. In the Bethlehem Alloy Steel Plant the production of uniform alloy steels is a habit.

You will see the results of this habit of uniformity in the way Bethlehem Gear Steels march through your heat-treating processes, one heat upon the heels of another, without the need for change in the treating curve.

Bethlehem Steel Company, Bethlehem, Pa.



BETHLEHEM *fine* **ALLOY STEELS**

▲▲▲ THE IRON AGE ▲▲▲

ESTABLISHED 1855

JANUARY 18, 1934

Vol. 133, No. 3

The Test of Purchasing Power ▲▲▲

MOST of us remember the old saying: "What this country needs is a good five cent cigar." Like most of the old saws which are uttered with oracular finality, it is but a half truth at most. It should have an addendum, such as—"and plenty of people with nickels to buy them."

In due course, the good five cent cigar eventuated, but as an incident of depression, not as an evidence of prosperity. It arrived in an era of low purchasing power. Even so, it needed people with money more than it was needed by people without money. All of which may indicate that "price" is not as important as "having the price."

As a matter of fact, in the days when the adage was coined, what this country really needed more was a good, low-priced motor car. And it did get many millions of them, in due time, with extremely beneficial results to employment and general prosperity.

The star of hope again hangs high over Detroit and its sister automotive cities, as makers of motor cars look forward to a greatly increased demand for their product. The results, as revealed from week to week to come, will chart the status of American purchasing power. And they will do this quite accurately because the bulk of automobile sales will be bought by small earnings and small savings, not by big money either from private or public purses. A large and sustained demand for motor cars will be concrete evidence of increased and well dispersed purchasing power.

It behooves all of the members of our industry to keep their eyes on Detroit during the coming weeks, regardless of whether or not one has a direct interest as a material or parts supplier. For in these days of artificial stimulation of business, it is well to watch one indicator that is comparatively free from the effects of hypodermics. And while automobile production and demand does indirectly feel such effects as those of the AAA, nevertheless it will be the most reliable general prosperity indicator that we will have available during the coming months.

The Normal Basis for Corporation

THE controlling reason for recognizing the propriety of a liberal scale of salaries for corporation officials is that any attempt at an undue limitation of such salaries will have the very certain effect of forcing the more capable of existing, or potential, corporation executives into occupations offering promise of higher personal rewards. Trade and the professions, which, perhaps, already draw too heavily upon the available national talent, will profit still further at the cost of a lowered efficiency in the vital instrumentalities of our national economy.

As a further and almost equally important argument against the arbitrary limitation of salaries, it will be only human nature for those executives who remain in corporation service to seek collateral gains to offset what they may instinctively feel to be an unfair denial of direct rewards. To this extent there may be a breaking down of very genuine progress which has been made in recent years toward the building up of high standards of professional conduct among corporation executives. Each year, perhaps even during the demoralization of the "new era," there has been an increase in the number of corporations in which officers and directors have *not* profited from inside information at the expense of stockholders. Each year the average of integrity in purchasing departments has risen. Each year, also, there has been a quiet but important gain in the number of executives who give human-minded and conscientious regard to their obligations to subordinates.

To obstruct this trend, by truckling to the mob spirit of envy of superior

WHAT are proper executive salaries? The question seems to be one to which the Administration and Congress may give some attention.

Col. Rorty discusses this subject from a common-sense statistical standpoint. In addition to showing that poor management is a dear purchase at any price, he explodes the notion that salaries, at the top, are penalizing the forgotten man below. And he establishes a unique generalized normal scale of salary and wage relations.

position and success, is to commit a major crime against our national welfare. It may be well enough to argue that incentives other than those of salary should, in time, have a controlling influence with desirable executives, provided it is recognized that liberal salaries still have their weight with the bulk of capable and conscientious men. The time to substitute other incentives is not when it is conceived they *should* apply, but when in practice they actually *do* apply.

To defend a reasonable, or even a liberal, scale of corporation salaries, does not involve a similar defense of the spectacular bonuses which have recently aroused so much adverse criticism. There is a fairly definite law which determines *reasonable* salaries in an organization of any given size. Such reasonable salaries will attract and hold competent men against the temptations and attractions of trade and the professions. The difference between such reason-

able and natural scale of salaries and the minimum scales and arbitrary limitations which have been proposed is, in the average case, less than 1 per cent of total payrolls—as compared with wastes under even slightly incompetent management which may be many times such amount.

Higher Pay, Better Work

Skilled executives know that, even with the fullest recognition of merit in groups of subordinate employees, the higher paid workers still tend to give a greater real return per dollar of wages paid. The same principle applies throughout the entire range of a normal salary scale. There are bound to be exceptions, but, where promotion is based on tested merit, the rule still holds true that the higher salaried officials tend to give the greatest returns per dollar in efficiency and productive effort. The high salary, on the normal scale, is not *given* to the competent official, but is more than *earned* by him.

During periods of normal business, the competitive demand for skilled executives and technicians tends, in itself, to establish the normal scale. The employers, or boards of directors, hire the skilled man, as they install the improved machine, not with the expectation of a bare return for the added expenditure, but in the hope of many times such gain. On the average, the skilled and highly paid man, like the superior machine, more than pays his way. There is loss rather than gain to industry, workers and consumers alike, in the false economy which installs the inferior man or the inferior machine.

As a further consideration, the relative steps in the normal salary and wage scale are based, throughout their entire range, upon certain instinctive perceptions by workers, themselves, of the differences which are proper in relative rewards. In the lower ranges of such scale these perceptions are so widespread and instinctive that little criticism arises. However, the same principles apply throughout, and criticisms of the upper ranges of normal salaries, when not purely envious or communistic, arise primarily because the public, as a whole, lacks that knowledge of

A GENERALIZED NORMAL SCALE OF SALARY AND WAGE RELATIONS

| Rank | Number in Rank | Relative Compensation | | | Relative Total Compensation | | Per Cent Total Payroll |
|-----------------------|----------------|-----------------------|---------|---------|-----------------------------|-------------|------------------------|
| | | Minimum | Maximum | Average | Lower Ranks | Upper Ranks | |
| President | 1 | 2,327 | 3,490 | 2,892 | | 2,892 | 0.1 |
| Vice-presidents | 7 | 1,235 | 1,853 | 1,482 | | 10,374 | 0.4 |
| Superintendents | 49 | 659 | 988 | 791 | | 38,759 | 1.4 |
| General foremen | 343 | 352 | 527 | 422 | 144,746 | | 5.2 |
| Foremen | 2,401 | 188 | 281 | 226 | 542,626 | | 19.7 |
| Operatives | 16,807 | 100 | 150 | 120 | 2,016,840 | | 73.2 |
| Totals | 19,608 | ... | ... | 140 | 2,704,212 | 52,025 | 100.0 |

Salaries

By M. C. RORTY

Past President
American Statistical Association, and
Former Vice-President
International Telephone & Telegraph Co.

the facts as to the higher salaries which they possess in adequate measure for the lower ranges of compensation.

A Normal Scale of Compensation

It is possible, without too great complications in calculations, to set up a generalized picture of the normal scale of compensation and grouping of employees in a large-scale organization. An attempt at such picture is made in the accompanying table, where it is assumed that the number of employees in each stage is one-seventh of that in the next lower stage—i.e., there are seven operatives to each foreman, seven foremen to each general foreman, etc.

To establish the relative compensation for each successive grade in the accompanying table, a base figure of 100 is used for the minimum wage, the maximum wage in each grade is assumed to be 50 per cent higher than the minimum, and the minimum compensation in each higher grade is assumed to be 25 per cent above the maximum in the grade just beneath. It is these latter relations which represent the perception by workmen, themselves, of reasonable gradations in compensation. They will readily recognize that as between junior and senior workers, skilled and relatively unskilled, in any particular group, real differences in capacity will ordinarily justify the more competent, even when not on piece work, in receiving at least 50 per cent more than the least competent. Similarly, among the more skilled workmen, who hope to attain to foreman's rank, there will be little question that such promotion should bring with it at least a 25 per cent increase in pay.

The especially interesting feature of this psychology of working compensation is that the gradations which exist are actually the result, not of any conscious attempt of employers to fix compensation according

to the economic value of each position, but rather of an unconscious acceptance of the mass opinions of workers as to the gradations which are proper. The conventional gradations probably could not exist if they were scaled at a higher rate than was justified by the real value of the various positions. But, with the conventional scaling ordinarily at a substantially lower rate than is justified from purely economic considerations, the psychological rather than the economic influence is the determining one.

Futility of Proposed Restrictions

As has been indicated, the considerations which operate to scale the compensation in the lower ranges of corporation organization are equally and similarly effective in the upper ranges. This orderly succession of advances in compensation from rank to rank necessarily leads, in large organizations, to substantial salaries in the upper ranges. However, it imposes no excessive burden of salaries as a whole. If, in the calculations made, we assume the minimum scale of 100 to represent earnings at the rate of \$1,000 per annum, the presi-

dent's salary would range from \$23,270 to \$34,900, the vice-presidents would receive from \$12,350 to \$18,530, and the superintendents from \$6,590 to \$9,880. Nevertheless, the total salaries in these three upper ranks would amount to only 1.9 per cent of total payrolls, or of the combined payrolls of operatives, foremen and general foremen. Furthermore, a limitation of the maximum salary to that \$10,000 per annum which Congress still holds to be reasonable, would reduce total payrolls by only 2/10 of 1 per cent and, if such reductions were distributed among all the operatives, would permit an increase in pay of only about 1 cent a day.

If, as an expansion of the table, we should assume an organization in seven stages, rather than six, the president's salary would range from \$43,630 to \$50,440. Similarly, with an eight-stage organization, the range would be from \$63,050 to \$94,575. In such organizations, owing to the greater payrolls, the president's salary would become a still smaller fraction of the total than with six stages, although the relations between total payrolls and the higher salaried

(Continued on Page 58)



Making Chevrolet Transmission

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

Main shafts are hardened in a Surface Combustion lead hardening machine consisting of six stations located on a radius of 4 ft. 6 in. The stations are: loading, preheat, lead pot, quench, dripping station, and wash. The work is loaded and unloaded by the only operator which the machine requires.

Shafts are hung on a fixture which is a part of the horizontal arms rotating around a vertical shaft. The operator loads the pieces to be treated on these fixtures, the work being mechanically conveyed to the various stations. When one operation is completed, an air cylinder controlled by the operator raises the arms, lifting the work clear of the stations. By means of a turning device, the arms are moved 60 deg. to the next station. Twenty-five shafts, suspended from

each arm, make the complete cycle in 7½ min. On this basis, the unit heats to a temperature of 1575 deg. F. at the rate of 725 lb. of net work per hour.

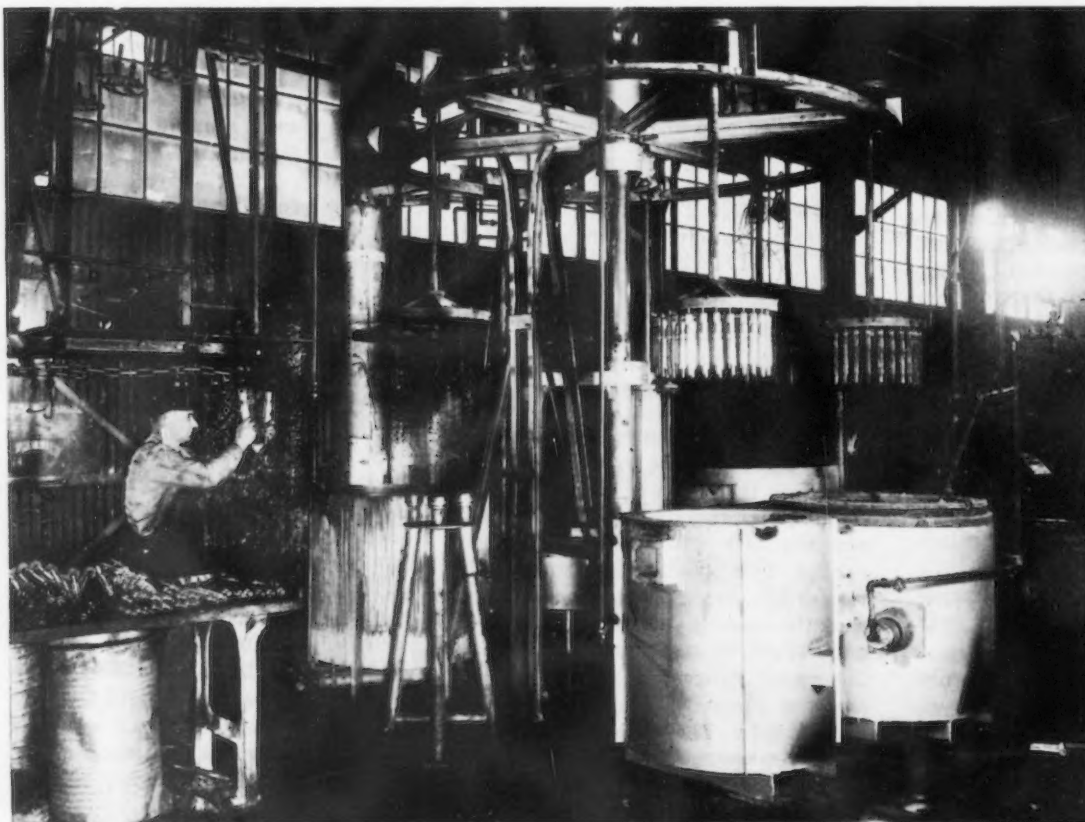
Before passing to the lead pot, shafts are preheated to 500 deg. The preheat chamber has an inside diameter of 3 ft. The inside diameter of the lead pot is 32 in. and the depth 20 in. The pot is heated by automatic proportioning high-pressure burner equipment. Burned gases leaving the lead pot are directed to the preheat chamber to preheat the work just loaded.

Battery of Cyanide Furnaces

Other transmission parts are hardened in a battery of 30 cyanide furnaces each of which is equipped with two standard automatic propor-

tioning high-pressure, two-stage velocity gas burners. These burners are installed on the periphery of the casing and fire tangentially to the lining of the furnace. Each furnace is 3 ft. 3 in. high from floor to top of pot, and its outside diameter is 4 ft. The pot has an inside diameter of 34 in. and is 20 in. deep. A hood covers the pot so that fumes can be vented from the building. When at operating temperature each furnace has a capacity for heating 400 lb. of work per hour from atmospheric temperature to 1460 deg. F. The temperature of the cyanide furnaces is controlled automatically by a battery of recording instruments.

Gears are hardened in the cyanide furnaces at about 30 deg. above the critical range, which is considered a safe margin. At that temperature



▲ ▲ ▲
Main shafts are hardened in a rotary lead hardening machine consisting of six stations. When one operation is completed, an air cylinder controlled by the operator raises the arms, lifting the work clear of the stations. A turning device moves the arms 60 deg. to the next station.
▼ ▼ ▼

Gears—II

H EAT-TREATING equipment at Chevrolet's transmission plant at Toledo, Ohio, includes a rotary lead hardening machine of new design, a battery of 30 gas-fired cyanide furnaces, and a special overhead draw furnace. In addition to describing this equipment, the accompanying article outlines Chevrolet's gear-testing methods. A previous article discussed the machining of Chevrolet transmission gears.

heat treatment results in economical gas consumption and in the elimination of considerable distortion in the work.

Countershaft gears, first and reverse gears, idler gears, second speed gears and clutch gears are annealed at a temperature of 1550 deg. F. in pusher-type, gas-fired four-row annealing furnaces. The length of the annealing cycle is 9 hr. Synchronizing cups, brake pawls and brake sectors are carburized to a case depth of 0.025 in., thrust washes to 0.020 in., high, low and reverse rails to 0.035 in., and idler and countershaft pins to 0.060 in.

Overhead Draw Furnace

Countershaft gears pass through a special draw furnace located overhead so as to conserve floor space in the

heat-treating department. This furnace is about 40 ft. square and contains 421 ft. of continuous overhead conveyor chain. At the loading station an operator places the gears on special carriers suspended from the chain. The work passes through a washing machine before it enters the furnace, where it makes a succession of trips from one end of the furnace to the other. As the conveyor emerges from the furnace at the opposite side from the loading station, it carries the work through another washing machine, which cools the parts sufficiently that they can be handled.

At either end of the furnace is a gas heater which, by means of a large fan, furnishes the hot air for draw purposes. Each fan is driven by a 2½-hp. motor. The overhead chain conveyor is of the variable

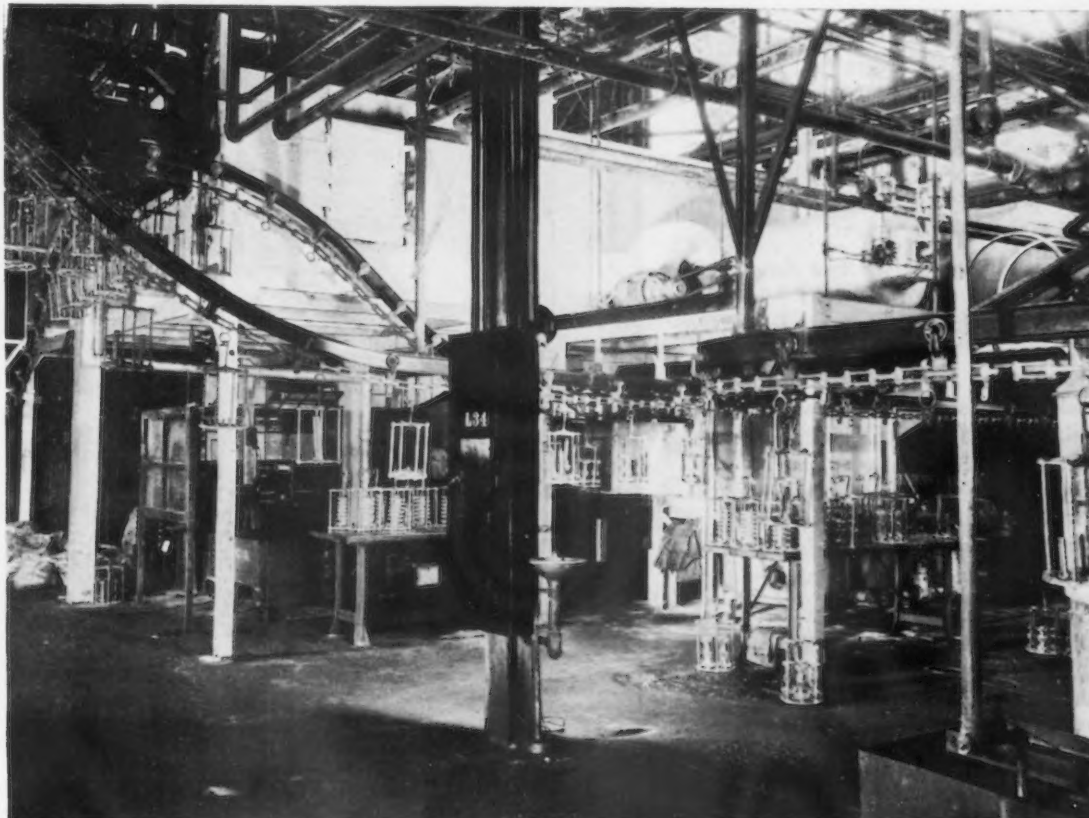
speed type. Two hundred eighty countershaft gears an hour are drawn in this furnace.

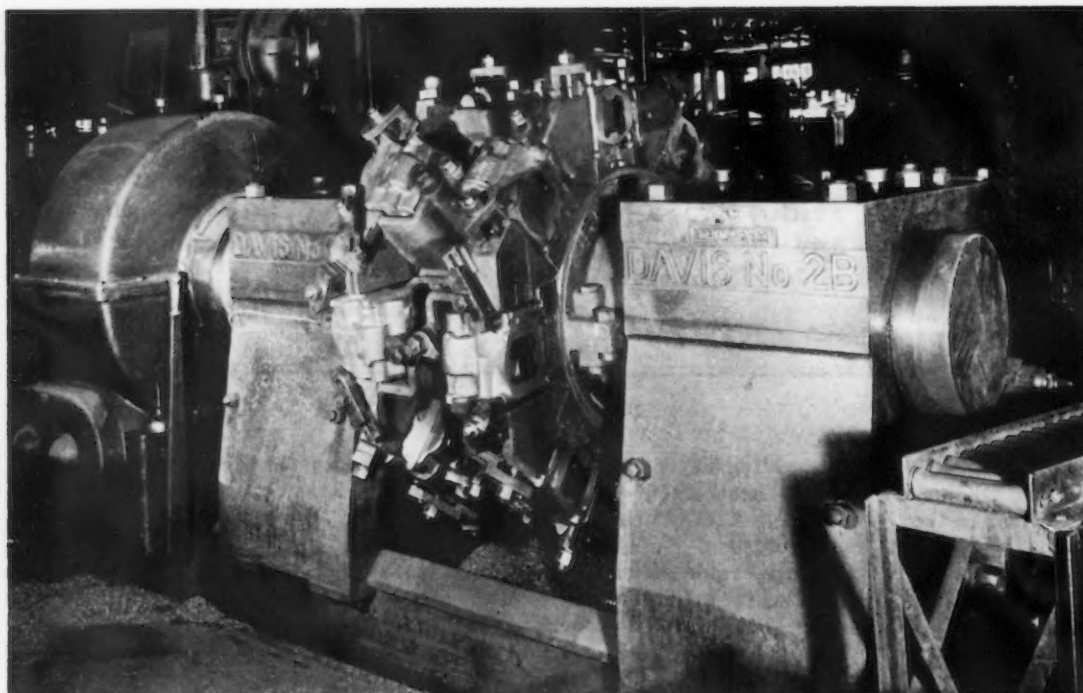
Following heat treatment, one of the most interesting machining operations is the diamond boring of a rolled bronze bushing in each end of the first and reverse and idler gears. This machine has a double-end fixture equipped with two standard chucks at each end, two gears being loaded while two are being bored. The fixture is hand operated. Approximately 0.010 to 0.020 in. of stock is removed, with about 190 units being bored per hour.

Both Ends of Case Milled Simultaneously

The cast iron case for the transmission is made at the Saginaw, Mich., foundry of the Chevrolet company and shipped to Toledo, where it goes

Countershaft gears pass through a special draw furnace located overhead so as to conserve floor space. At loading station (center of photograph) operator places gears on special carriers suspended from chain. At either end of furnace is a gas heater which, by means of a large fan, furnishes hot air for draw purposes.





Top of transmission case is milled in a 16-station rotary miller with special holding fixtures.

through a number of machining operations. Outstanding among these operations is the milling of both ends of the case simultaneously in rotary milling machines with eight stations and special holding fixtures. The milling of the top of the case is done in a machine of similar design with 16 stations.

Manufacture of Transmission Gears Under Rigid Control

As stated earlier, it is necessary to keep the manufacture of transmission gears under rigid control so that there will not be the slightest variation from the desired accuracy. Chevrolet has spared no expense in this respect, for gears are inspected periodically along the production line and are subjected to rigorous tests both before and after heat treatment.

Special equipment has been installed in a test room to check gear forms. The involute gear teeth curve, helix angle and gear teeth spacing are checked on a series of machines, including an involute checking machine, an angle checking machine, a tooth space checking machine, a universal helix angle and involute checking machine, and a Red Liner. Every set-up in the shop is tested in this manner.

Tooth bearings are run on special speeders so as to keep the work under constant control. All gears are checked for size and concentricity on a special machine. As an extra precaution, gears are taken out of production constantly throughout the day and sent to a special silent room

to be tested for noise and tooth bearings on special machines designed and built by General Motors Research Laboratories.

Completely assembled transmissions, prior to shipment to branch assembly plants, are taken to small silent rooms built within a much larger silent room to be tested on

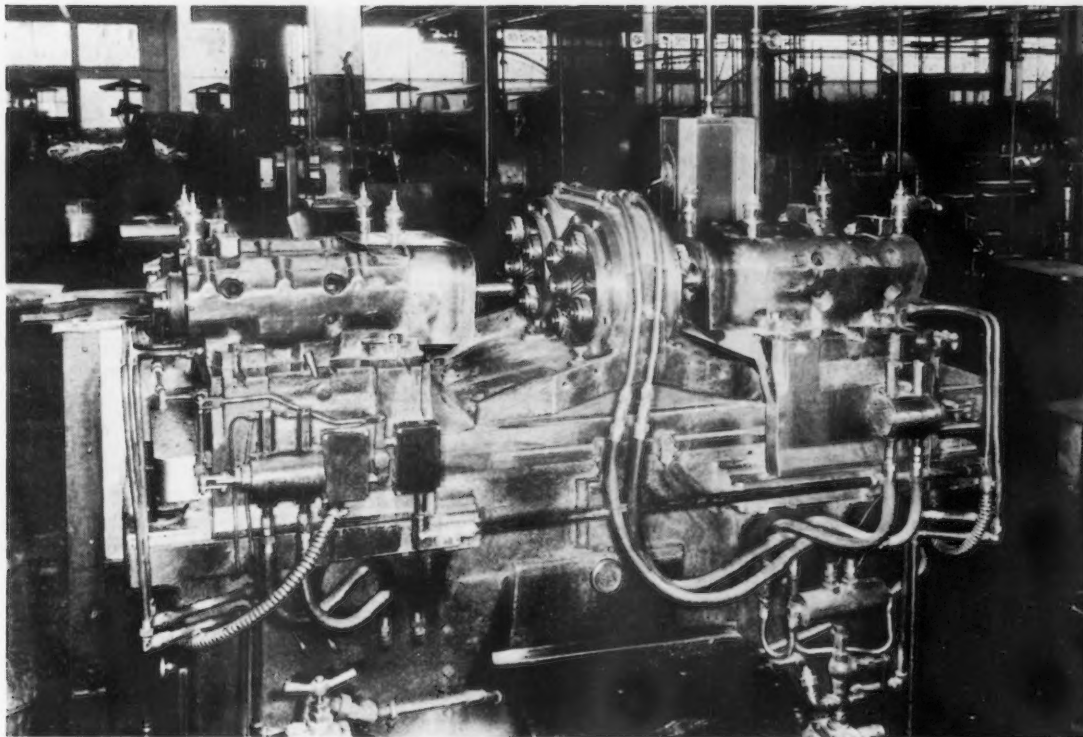
machines designed by General Motors Research Laboratories. These machines, having four speeds forward and one reverse, subject the transmissions to rigors duplicating those in service.

Transmissions are taken on an overhead conveyor from the test rooms to railroad freight cars with



The involute gear teeth curve, helix angle and gear teeth spacing are checked on a series of machines, every shop set-up being tested in this manner.

▲ ▲ ▲
 Rolled bronze bush-
 ing in each end of
 first and reverse gear
 and idler gear is dia-
 mond bored in a
 machine with a
 double-end fixture
 equipped with two
 standard chucks at
 each end, two gears
 being loaded while
 two are being bored.
 ▼ ▼ ▼



built-in wooden racks making it possible to place 600 transmissions in one car. A portable loading device is used to transfer the transmission from the chain conveyor to the interior of the freight cars. This device consists of

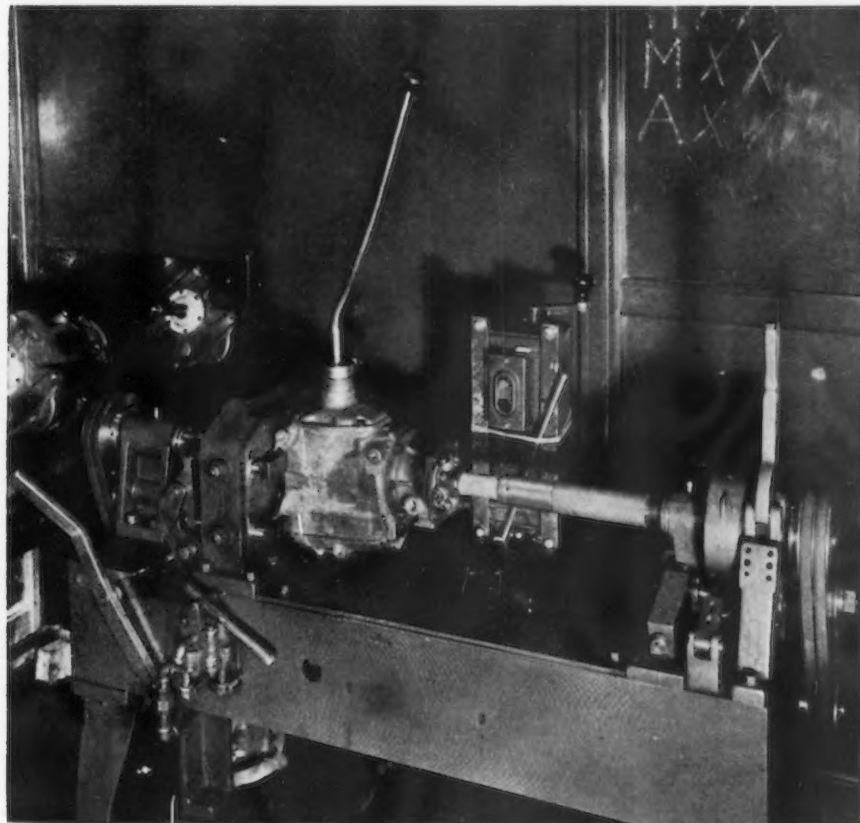
a belt conveyor of the endless type driven by a small motor.

Three series of transmissions are manufactured at the Toledo plant—for the Master Chevrolet passenger cars, for the Standard Chevrolet pas-

senger cars and for Chevrolet trucks. The plant can turn out 300 transmissions per hour.

A complete handbook dealing with cost and production methods can now be secured from the Ronald Press Co., New York. The extensive survey of modern practices is the work of more than 80 authorities and specialists, and concentrates on the problems arising from the current necessity that production operations be kept within rigid cost limits. The handbook analyzes and develops the best policies pertaining to production and distribution, and presents the most efficient methods applicable to the small and medium sized plant as well as the large concern. The various problems are clearly defined, and include reports, budgets, organization, planning production materials costs, planning labor costs, plant and equipment costs, control of manufacturing costs, and auxiliary methods for effective manufacturing.

The Department of Commerce is now distributing its fifty-fifth annual issue of the Statistical Abstract of the United States. The volume is a convenient summary of authoritative statistics showing the trends in trade and industry. All Governmental activities are completely analyzed, and the usual pertinent data concerning private enterprise are included. Because of the drastic economic and social changes made during 1933, this new work is of particular interest to business men, economists, statisticians, and students. The 790-page book may be secured from the Superintendent of Documents, Washington.



Completely assembled transmissions are tested on machines designed by General Motors Research Laboratories. Having four speeds forward and one reverse, these machines subject transmissions to rigors duplicating those in service.

Choosing the Right Drive—7

The Spur Gear Reduction Unit Method

THE modern spur gear reduction unit possesses driving features that in many instances can be employed to an advantage in both production shop and process plant driving. Standard machines have a ratio capacity from 1:1 to 500:1 and are capable of driving in line. The driving in line of the power input and output shafts in many cases is preferable to the right angle drive of the single worm reduction unit. Right angle driving is possible with the spur gear unit, but it necessitates incorporating a bevel gear set in the same housing with the spur gears as shown in spiral gear form by Fig. 47. The right angle spur reducer as illustrated can be manufactured with power capacities from $\frac{1}{2}$ to 500 hp. with a sustained efficiency of 96½ per cent, but in this particular design the ratio capacity is limited to a multiple of the gear ratios involved.

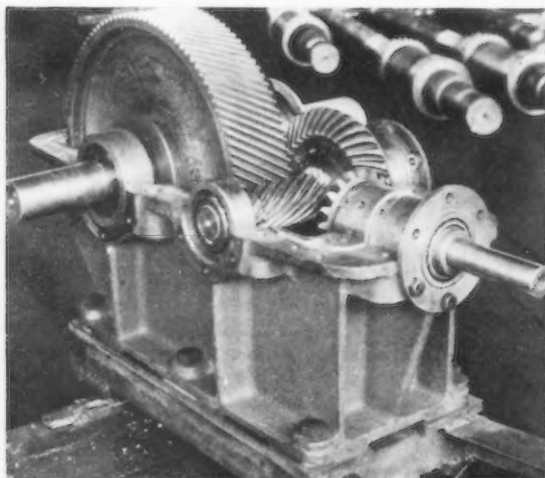
Another type of right angle spur unit, shown by Fig. 48 employs the bevel gear set in combination with the multiple planetary unit. This type has lower power but higher ratio capacity than the unit shown by Fig. 47. The term "spur gear reduction unit" generally signifies the "shafts

THIS is the seventh installment in the author's series on the selection of mechanical power transmission methods. In it, Mr. Staniar deals with modern spur gear reduction units, in which category he includes both straight line drives and right angle drives through bevel gears.

in line" design and is mostly employed because if direct connected right angle driving is required in ratios up to 80 to 1, there is no advantage in using the combination spur and bevel gear unit in place of the single worm reduction gear. The regular "in line" spur gear reduction unit is manufactured in two types known as the "planetary" and "non-planetary," the difference being based on gear arrangement. Such difference results in a disparity of ratio range. The planetary type, as shown in section by Fig. 49, is capable of the largest speed reduction. It consists of spur gears acting as idlers radially disposed about a central pinion which in turn mesh with a stationary internal gear. The idlers revolve on their own axis and in addition are free for epicyclic movement on the internal gear. To ac-

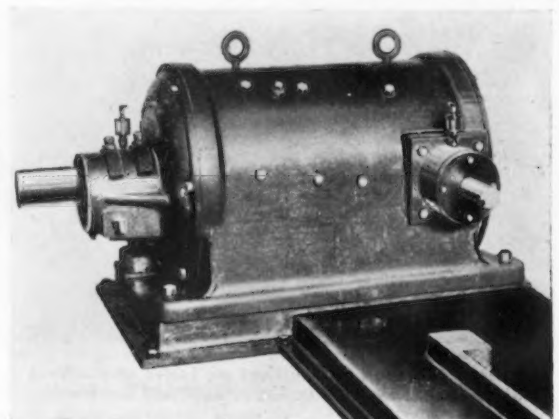
complish such action the idlers are mounted on studs which are rigidly fastened to a spider mounted upon the slow speed shaft. The planetary reducer with single reduction has a ratio capacity from 4 to 8 to 1, but should not be considered for ratios of less than 3 to 1. When a ratio of 8 to 1 is exceeded on a single reduction planetary type, the reducer becomes large in diameter and when the ratio is reduced below 4 to 1, the speed at which the idler assembly revolves within the internal gear becomes excessive, causing foaming of the oil in the casing with consequent heating and power loss. Ratios such as 100, 200, 400 and 500 to 1 are possible with the planetary type by the reductions being doubled or tripled and coupled in series in the same housing.

The non-planetary type of spur gear reducer, as shown in section by Fig. 50, has the advantage of furnishing comparatively low reductions while keeping the rotational speeds at a minimum. Ratios as low as 1 to 1 and as high as 300 to 1 are practicable with this type. It consists of spur gears radially disposed about a central pinion. The spur gears are keyed directly to pinions which in



▲ ▲ ▲
(At Left), Fig. 47.
Right angle driving
in spur gear units is
attained by the use
of a pair of bevel
gears.
▼ ▼ ▼

Fig. 48. In this right angle spur reduction unit, a bevel set is employed in connection with a planetary unit.



By WILLIAM STANIAR
Mechanical Power Transmission Engineer
E. I. DuPont de Nemours & Co.



turn mesh with a central gear mounted upon the slow speed shaft.

The modern spur gear unit is entirely inclosed in a cast iron housing as shown by Fig. 51, with all gears and moving parts operating in oil, applied by either the splash or circulating system.

Uses

There are occasional possibilities of employing the spur gear reduction unit in production shops, but its chief usefulness occurs in the process plant because of the frequent necessity of high ratios between power source and application. With ratio capacities in standard units of the "driving in line" type from 3 to 1 to 500 to 1 and in the standard bevel gear right angle drive combination units up to 2500 and 3000 to 1 it is obvious that practically any ratio demand can be satisfied. As in all types of reduction gears the ratio and input speed ratings are governed by the power capacity. Averages for standard machines of the "in line" type are as follows:

From 4.5 to 225 hp. the ratio range is 3.25 to 408 to 1 with input speeds from 100 to 900 r.p.m.

From 0.76 to 88 hp. the ratio range

is 2.74 to 506 to 1 with input speeds from 100 to 1200 r.p.m.

From 0.38 to 30 hp. the ratio range is 2.60 to 466 to 1 with input speeds from 400 to 1500 r.p.m.

From 0.11 to 6.25 hp. the ratio range is 2.04 to 406 to 1 with input speeds from 600 to 1800 r.p.m.

The ratio capacity of the combination bevel gear and planetary type spur reducer naturally is higher because of the multiple of ratios and its power ratings are higher in proportion to its complete reduction. The power ratings of the spiral bevel in

combination with the spiral spur gears, as shown in Fig. 47, are much higher based on the restriction of ratio capacity. The right angle spur reduction unit can be obtained in special design for vertical driving as shown by Fig. 52. There are occasions where it is adaptable based on extremely high ratio demands, but for the average requirements it is not as practicable as the vertical worm reduction unit owing to the necessity of greater headroom. Regardless of the maximum power capacities of the

Fig. 50. Rotational speeds are kept to a minimum in the non-planetary type of speed reducer.

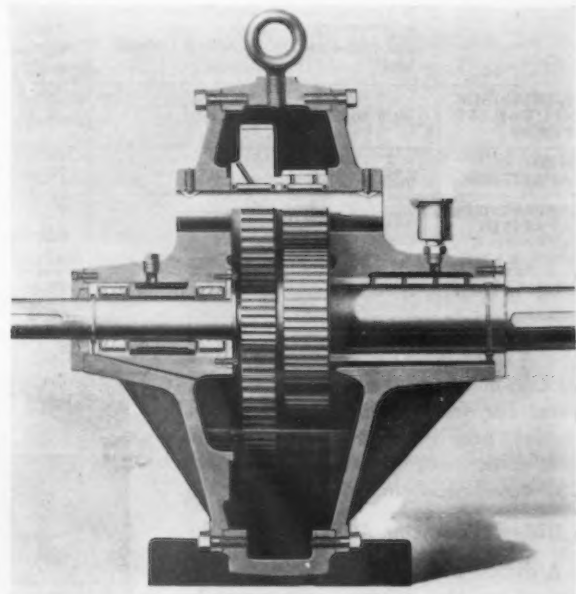
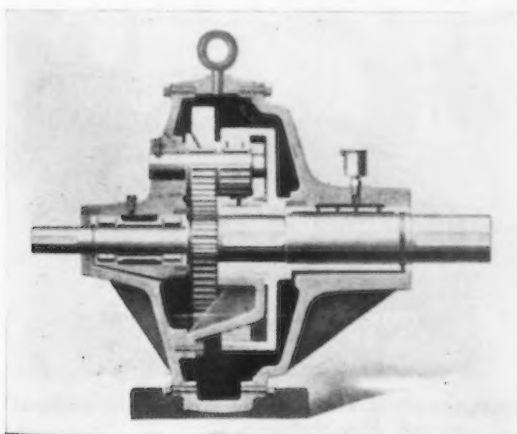


Fig. 49. Planetary type spur reducer sets are capable of larger speed reductions than other types.



(At Right), Fig. 51. In the modern spur reducer unit, the gears are entirely enclosed and the moving parts are automatically lubricated.

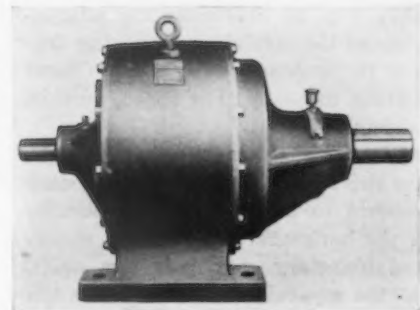




Fig. 52. Special designs for right angle vertical driving are available.

"in line" unit its use is more extensive in the low power field. This is no doubt caused by its ease of adaptability to peculiar locations and close quarters where small power units are generally required. Three

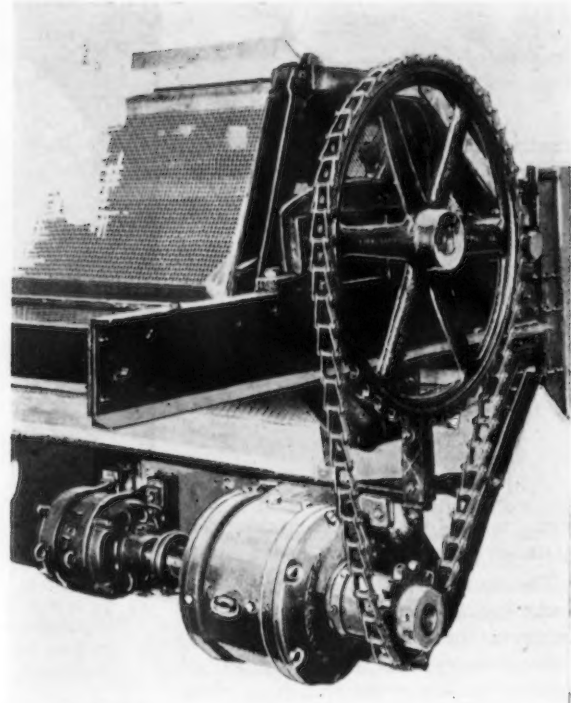


Fig. 53. A difficult location for a reducing unit drive mounting, in which a chain belt helped to solve the problem.

Production Shop and Process Manufacturing Plant Driving

| METHOD | Spur gear reduction unit | |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TYPES | Straight line drive | Right angle drive |
| SERVICE | For direct connected line-shaft driving in both production shops and process plants Where horizontal straight line drive is necessary For moderately powered steady loads | For vertical driving, when unit can be placed at bottom of driven equipment and where headroom is not limited For right angle high ratio driving For high power low ratio driving For moderate and high powered steady loads |
| PERMISSIBLE INPUT SHAFT SPEEDS | 100 to 1800 r.p.m. | 50 to 1800 r.p.m. |
| RATIO CAPACITIES | 2.04 to 506 to 1 | 10 to 3000 to 1 |
| HORSEPOWER CAPACITIES DEPENDING UPON RATIO | 0.11 to 225—standard Higher—special | 0.50 to 500 |
| LUBRICATION | Fluid lubricant by either splash or circulating system | Fluid lubricant by either splash or circulating system |

advantage of being independent of motor troubles.

The spur gear reducer can be utilized for the direct driving of line-shafting for both production shop and process plants when structural conditions prevent belt, chain or V-rope connection between motor and line-shaft and where a flexible connection is unnecessary.

Presentation of five gold watches was made recently by Ambrose Swasey, chairman of the board of Warner & Swasey Co., Cleveland, to five men with 25 years' of service with the company. This brought the total number of watches given to employees with a 25-year record to 57.

to five horsepower demands are frequent for small apparatus direct connection and in many instances the spur gear reducer makes a compact and economical installation possible.

Difficult Location Problem Solved

A difficult location is shown by Fig. 53, where the driving unit must be supported on the side of a floor beam, while Fig. 54 illustrates the adaptability of the straight line driving feature in combination with large bevel gearing to heavy slow speed, vertical driving.

The use of the independent straight line drive spur gear reducer is being lessened to a certain extent because of the horizontal and vertical motorized planetary spur reduction units, but the separate reducer still has the

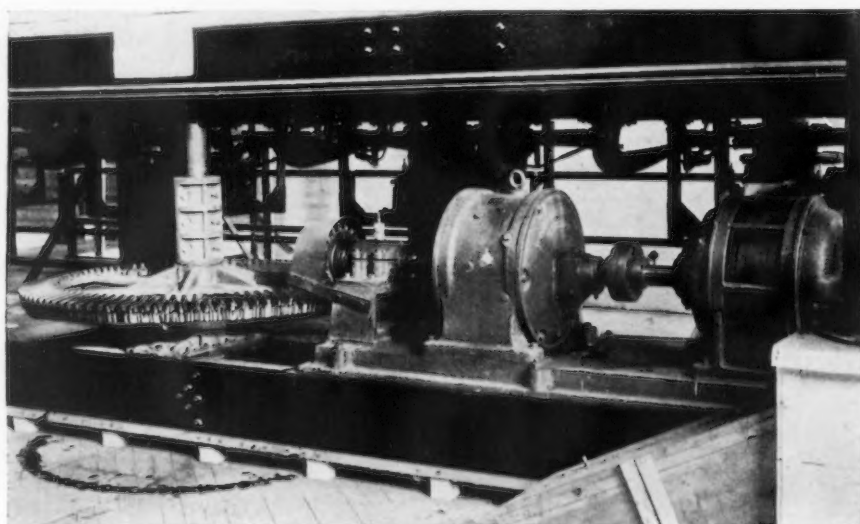


Fig. 54. A slow speed vertical reducer unit in which a large bevel gear is employed on the vertical drive shaft.

The Public Debt

By WALTER S. GIELE

THE latest high record in the gross amount of the public debt of the United States occurred on June 30, 1933; if we consider the purchasing power of its dollar value in terms of commodities.

The accompanying chart was prepared from figures obtained by dividing the dollar values, as reported, by the corresponding values of the Bureau of Labor Statistics' wholesale commodity price index based on the average for the year 1926. Thus the values obtained represent dollars having a purchasing power, in terms of commodities, equivalent to the average purchasing power of dollars in 1926. We may for convenience call them "1926 dollars."

The increase in the gross dollar amount of the public debt from June 30, 1933, to December 31, 1933, would appear as a substantial decrease in terms of the "1926 dollar." Such is the effect of rising commodity prices.

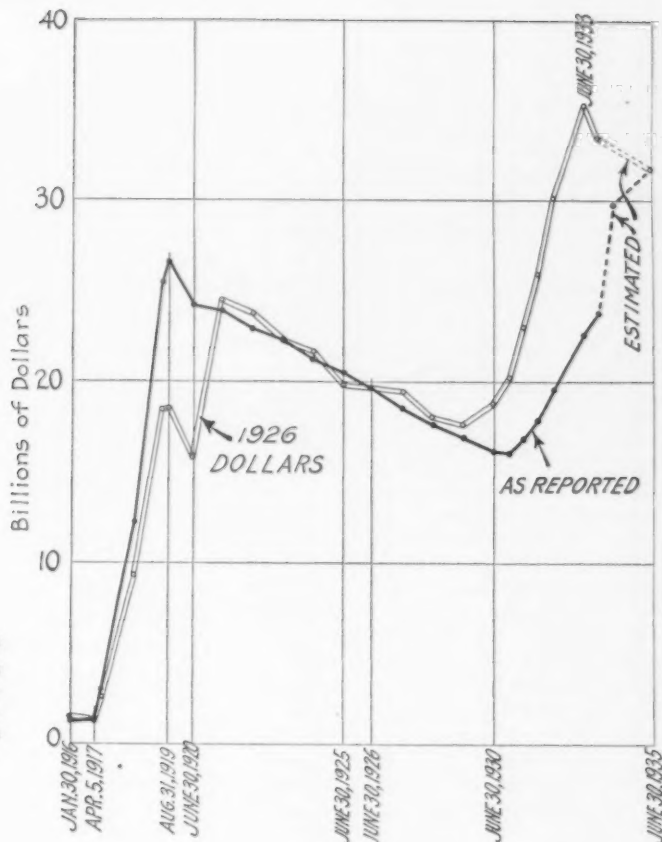
A further reduction would be represented by the "new high record" of \$31,847,000,000 in the gross amount of the public debt forecast by President Roosevelt for June 30, 1935, should the administration's declared objective of a "1926 price level" be attained by that date.

Neither the rate nor the amount of increase in the public debt now contemplated is so great as during the World War years. Only for the period from December 31, 1933, to June 30, 1934, is the proposed rate of increase more rapid than it was during the War. The overall rate from December 31, 1930, to June 30, 1935, is relatively much slower than was the rate from April 5, 1917, to August 31, 1919.

The \$15,821,000,000 amount of increase in gross public debt from December 31, 1930, to June 30, 1935, if realized, will be but 62½ per cent of the \$25,312,299,000 increase from April 5, 1917, to August 31, 1919.

It seems quite certain that even \$31,847,000,000 will be a considerably smaller percentage of the probable national wealth of the country in

Gross public debt of the United States since 1916, as reported in actual dollars and as it appears in 1926 dollars.



1935 than was the \$26,594,268,000 debt in 1919 of the national wealth in that year.

Neither the cost of the World War, however, nor the cost of the war on depression is to be measured solely by the increase in the public debt.

The annual report of the Secretary of the Treasury for 1932 shows "Money Cost of the World War to United States Government to June 30, 1931"; gross \$52,831,360,000 and net \$39,158,649,000.

Recovery measures planned to date will have cost \$16,500,000,000 when carried into effect. Of this amount \$5,500,000,000 is returnable to the Reconstruction Finance Corporation, which would leave an ultimate net cost of \$11,000,000,000.

On the whole, eleven billions for recovery would seem a wiser investment than thirty-nine billions for war. Nor will the recovery program leave behind it a continuing obligation to care for its veterans.

Mesabi Range Ore Shipments Again Lead

IRON ore shipped from the Mesabi Range in 1933 was 62.3 per cent of the total amount moved as compared with 54 per cent in 1932 and 65 per cent in 1931, according to the annual report of the Lake Superior Iron Ore Association covering water shipments for the year. The Marquette Range, which advanced to third place in 1931, took second place in tonnage shipped last year relegating the Gogebic Range to third position. Shipments by other ranges retained the same relative positions as during the previous year.

Bessemer ore shipped counted for 26.4 per cent of the total of 21,407,809 tons or a slightly lower percentage

than in 1931 when the total movement was comparable to that of last year. Shipments of non-Bessemer ore were 68.8 per cent of the total as compared with 67.2 per cent in 1931.

| Total by Grades | |
|---------------------|------------|
| Bessemer | 5,657,467 |
| Non-Bessemer | 14,732,397 |
| Manganiferous | 675,167 |
| Silicious | 332,842 |
| Aluminiferous | 9,936 |
| Grand Total | 21,407,809 |
| Total by Ranges | |
| Mesabi | 13,354,482 |
| Marquette | 2,734,447 |
| Gogebic | 2,376,778 |
| Nenominee | 1,493,524 |
| Vermilion | 732,996 |
| Cuyuna | 715,582 |
| Grand Total | 21,407,809 |

The Structure

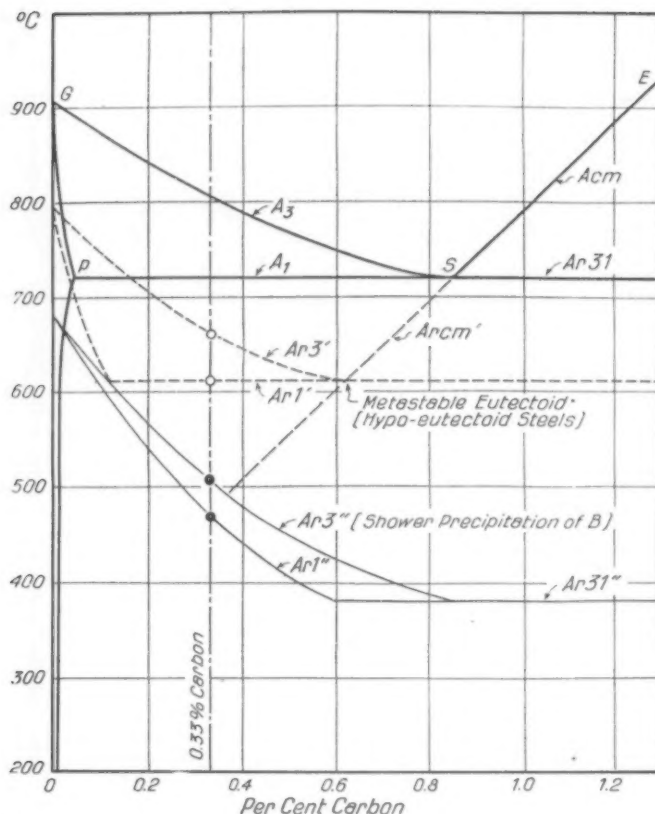


Fig. 37—A new constitution diagram for quenched steels.

TO avoid confusion, symbols will be used to designate what are believed to have been the various phases present in the samples of which the behavior was described in previous issues of THE IRON AGE. The symbols and their meaning are:

- B—Solid solution of carbon, etc., in iron having body-centered cubic arrangement of atoms.
- F—Solid solution of carbon, etc., in iron having a face-centered cubic arrangement of atoms.
- T—Solid solution of carbon, etc., in iron having a tetragonal arrangement of atoms.

Of these phases, B, when alone, has a ferritic structure; F, when alone, an austenitic structure; and T, when alone, a martensitic structure. The term "conglomerate" has been applied to a species of structure composed of B and iron carbide—a species of which pearlite, sorbite, troostite, and mixtures of these are varieties. The term "Widmanstätten" has been applied to a structure composed of plates or blades of B, the interstices between which are filled with material of constitution similar to that of conglomerate—it is composed of B and iron carbide.

Although as rates of cooling increased, the difference in temperature between Ar_3 and Ar_1 was reduced, these points did not merge. It can be said that no such single point as Ar' exists for this steel, nor for that matter are the conditions which produce such a point in any steel easy to ob-

tain—particularly in such as have a carbon content below 0.36 per cent.

It is proposed, therefore, to refer to the depressed Ar_3 point as the Ar'_3 point, and to the depressed Ar_1 point as the Ar'_1 point. These points (Ar'_3 and Ar'_1) are metastable points.

To the temperatures at which F changes to B (shower precipitation of B) with formation of a Widmanstätten structure it is proposed to apply the symbol Ar'_3 ; and to the temperature at which, after shower precipitation of B, residual F changes to conglomerate it is proposed to apply the symbol Ar'_1 . The latter point corresponds to that hitherto called the Ar'' point. The Ar'_3 and Ar'_1 points are labile change points.

New Constitutional Diagram

The author's discovery of the dual nature of the Ar' and Ar'' points is of considerable importance, and to embody the new views a new diagram shown in Fig. 37 was prepared.

It is difficult, of course, to draft a satisfactory diagram with so little information about the positions of the Ar'' points for the alloys of the system. The positions of the Ar'_1 points, however, have been well established by French and Klopsch¹ and confirm the Ar'' line in the author's new diagram. The author's value (467 deg. C.) for the Ar'_1 point agrees closely with the values of Ar'' found by French and Klopsch for steels with about the same carbon content, but with neither chromium nor nickel. The Ar'_3 line in Fig. 37 is tentative, to say the most.

In Fig. 37, points on the heavy black lines represent the temperatures at which the alloys of iron and carbon transform under conditions of equilibrium. For purposes of discussion only, assume that the steel investigated was a pure alloy of iron, containing 0.33 per cent of carbon only. This alloy, when cooled from 850 to 350 deg. C. in about 350 sec., showed an Ar'_3 point at about 660 deg. C. and an Ar'_1 point at about 610 deg. C. In Fig. 37 these points are indicated by open circles through which broken lines have been drawn. These broken lines (the Ar'_3 and Ar'_1 lines) intersect at about 0.62 per cent carbon, meeting at their point of intersection the carbide line SE which, without change of direction, has been extended into the region below the equilibrium eutectoid line. The significance of the Ar'_3 and Ar'_1 lines is as follows: If, for example, steel containing 0.33 per cent of carbon be cooled from 850 to 350 deg. C. in 350 sec., portions of the F composing the steel will start to transform into B at 660 deg. C. (Ar'_3) and will continue to change until at 610 deg. C. (Ar'_1) part of the residual F will transform into conglomerate containing 0.62 per cent carbon. No information can be derived from the diagram regarding the proportions of F which transform (1) into B as the steel cools from Ar'_3 to Ar'_1 and (2) into conglomerate when the steel reaches Ar'_1 .

If it be assumed that the constitution diagram represented by the broken lines in Fig. 37 is that for all alloys of iron and carbon which cool from 850 to 350 deg. C. in 350 sec., then it may be said that, under these conditions of cooling, part of the 0.62 per cent carbon steel will transform into conglomerate at 610 deg. without previous transformation of F into B. In brief, the 0.62 per cent alloy becomes a metastable eutectoid under these conditions of cooling.

In the case of the 0.75 per cent carbon alloy, partial change of F would first occur at about 680 deg. C., when carbide would form and crystallize, possibly within, as well as at the boundaries of, the grains of F. Near these carbide nuclei some F would transform into conglomerate. Just as the diagram fails to say what proportion of F will be involved in the changes at the Ar'_3 and Ar'_1 points in the metastable hypoeutectoid steels, so it fails to reveal what proportion

¹French and Klopsch Transactions, A.S.S.T., Vol. 6, 1924, p. 251.

of an Alloy Steel

By OWEN W. ELLIS

Director of Metallurgical Research
Ontario Research Foundation, Toronto, Canada

of F will be involved in the changes at the Ar_{cm1} and Ar_{s1}' points in the metastable hypereutectoid steels.

The experiments on the 0.33 per cent carbon alloy have shown that, provided its grain size is sufficiently large, only part of the F will change at 660 deg. C. (Ar_s') and 610 deg. C. (Ar_s'') under the specified conditions of cooling. Some F, therefore, will remain unchanged until 505 deg. C. (Ar_s'') is reached. This point (at which shower precipitation of B commences) is represented on the diagram by a closed circle, as is also the Ar_s'' point for the same steel (467 deg. C.). Through the latter the Ar'' line, due to French and Klopsch, has been drawn. This has been continued to intersect the zero ordinate of the diagram at 685 deg. C. in view of the work of other investigators. From this point a tentative Ar_s'' line has been drawn through the Ar_s'' point for the 0.33 per cent carbon steel and has been continued beyond it until it intersects the French and Klopsch Ar'' line at 0.85 per cent carbon.

Development of Body-Centered Blades

The diagram now shows that, given the conditions of cooling already specified, and provided the grain size is sufficiently large, that part of the F which underwent no change on passing through the Ar_s' and Ar_s'' points will develop blades of B at 505 deg. C. and, further, that at 467 deg. C. the F that remains will transform into a mixture of carbide and B. In the 0.62 per cent carbon alloy, the F that remains unaltered after the steel has passed the Ar_s' point will begin to develop blades of B at about 420 deg. C., and the residual F will change into conglomerate at about 380 deg. C. In the 0.75 per cent carbon alloy, the F that remains unaltered after the steel has passed the Ar_{s1}' point will begin to develop blades of B at about 395 deg. C., and the residual F will transform at 380 deg. C.

One other thing the diagram tells—namely, if steel be cooled at rates in excess of the critical, F will change into T at temperatures represented by the Ar'' line, and martensitic structures will result.

Increasing the time of cooling (850–350 deg. C.) beyond 350 sec. will raise the Ar_s' and Ar_s'' lines, which, of course, will always intersect at the

IN THE IRON AGE, issues of Sept. 28 and Nov. 2, the author presented data covering the behavior of alloy steels under different conditions of heating and cooling. The accompanying article was presented at the annual A.S.T. convention, and represents the concluding portion of Mr. Ellis' investigation. A new constitutional diagram for quenched steels is drafted, fully described and discussed, and the theory of formation of pearlite, troostite and nodular troostite is presented with suitable illustrative diagrams. The author differs with Robertson and Carpenter regarding the mechanism of the formation of structures of various types in steels which had undergone various coolings; therefore his detailed explanations of the salient features of the phenomena are of additional interest.

extended SE line. Decreasing the time of cooling below 350 sec. will lower these lines.

It appears from Fig. 37 that Ar_s' cannot be depressed below 490 deg. C. (the temperature corresponding to the point of intersection of the extended SE line with the Ar_{s1}'' line), since shower precipitation of B will occur here in what becomes, under these conditions of cooling, a metastable eutectoid steel. The time of cooling (850–350 deg. C.) which will depress Ar_s' to 490 deg. C. may be estimated from Fig. 17.² For coarse-grained steels of about the analysis of the steel investigated by the author it will be about 250 sec.; for fine-grained steels, about 115 sec. These are the times of cooling which produced Widmanstätten structure just wholly free from conglomerate in the author's steel.

A single Ar_s' point can occur only in steels containing more than 0.36 per cent carbon, and then only under specific conditions of cooling—i.e., conditions which cause the steel to become eutectoid.

Formation of Various Structures

It is the opinion of the author that on cooling steel (0.33 C; 0.69, Mn; 1.30, Ni; 0.73, Cr), iron atoms at va-

rious points (transformation foci) on the boundaries of the F crystals commence (Ar_s') to rearrange themselves upon a body-centered cubic lattice. This would probably apply also to other hypoeutectoid steels of different compositions. The rate of formation of these foci per unit area of boundary varies with the degree of undercooling which, itself, is intimately related to the cooling time. When the degree of undercooling is small, transformations will start at relatively few points per unit time. As the rate of cooling is increased, the number of foci formed per unit will be definitely raised; if, however, the rate of cooling be sufficiently increased, the rate of formation of foci will be considerably reduced, if formation is not entirely prevented.

It will facilitate discussion if attention be concentrated on the behavior of a single grain F during its cooling from θ_{max} . (See Fig. 38).

At Ar_s' rearrangement of iron atoms may be imagined as proceeding inwards from the boundary of the grain uniformly in all directions from a number of foci, since, apart from the fact that the position of the lattice planes relative to the crystal boundary may cause slight local variations in the directions and rates of rearrangement of atoms, conditions will be practically the same on all sides of the foci. Individual foci may be considered, then, the centers of hemispheres (see Fig. 38a) of which the expanding surfaces are interfaces between B and F. These interfaces will be referred to hereafter as "B interfaces." If the degree of undercooling is low, the number of transformation foci which form per unit time between Ar_s' and Ar_s'' will be relatively small.

If it is assumed (1) that the solubility of carbon in B is so low that it may be neglected, (2) that the carbon rejected by B is absorbed on the interface, and (3) that, while the hemispherical surfaces are expanding, no diffusion of carbon in F occurs, then one can imagine all the carbon atoms ejected from B collecting on the F side of the B interface. Given these conditions, the average concentration of carbon at the interface would, within certain rather narrow limits (i. e., before the atoms of carbon piled up in layers more than one atom thick), double itself each time the radius of the expanding hemispherical surface

² THE IRON AGE, Sept. 28, 1933.

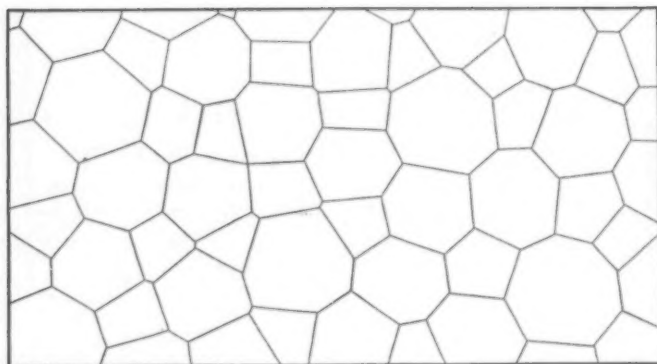


Fig. 39 — Diagrammatic representation of appearance of contracting B interface.

was doubled. The stage would soon be reached where F became supersaturated with carbon. At this point carbide would form with consequent cessation of the expansion of the interface. The formation of carbide (a) would, of course, permit the formation of a small amount of B (b) in its vicinity, but, without diffusion of carbon, these two reactions (a) and (b) would cease.

Diffusion of carbon from the B interface into F will both lower the concentration of carbon in F at the interface and allow the formation of a concentration gradient of carbon in F. The greater the rate of diffusion, the less at any time will be the concentration of carbon in F at the interface, and the lower the concentration gradient.

Formation of Pearlite

As the hemispherical surfaces expand inwards from the boundary, a stage will be reached where the surfaces merge (see Fig. 38b). Thenceforward, the interface between F and B, now continuous, will tend to contract, as is shown diagrammatically in Figs. 38b and 38c.

The interface will become geometrically similar to the original boundary of the unchanged grain F. Despite what has been suggested, the possibility must not be overlooked that transformation of F to B may proceed more rapidly in certain crystallographic directions than in others. If this be true, the B interface will, as it contracts, differ increasingly in geometrical form from the original boundary of the unchanged grain of F.

Where the expanding spherical surfaces last merge to form the continuous contracting B interface, the concentration of carbon in F will be highest. Such regions will be connected by planes of high carbon concentration. The concentration of carbon at the mid-points of the traces of the planes on the interface, and of the planes themselves, will be a minimum. The interface, then, may be imagined as broken up into many more or less uniform areas, polygonal in plan (Fig. 39). At the corners of the polygons the carbon content will be a maximum, at the centers a minimum. Along

the edges of the polygons the carbon content will vary from a maximum at one end to a minimum at the center and will return to a maximum at the opposite end of the edge. In Fig. 39 is shown in plan what is thought likely to be the appearance of the contracting B interface as viewed from the interior of the grain shortly after the merging of the hemispherical surfaces. The polygonal areas are segments of spheres bounded on all sides by lines which are the traces of the planes of contact between the expanding hemispheres. An observer, seated at the center of the grain, might imagine himself looking on foam whatever the direction of his gaze. The foam-like structure would tend to disappear as the B interface contracted.

Although diffusion of carbon continues as the interface contracts, the concentration of carbon at relatively regular intervals will probably endure until the carbon atoms at the more saturated regions of the interface commence to unite with iron atoms to form carbide (see Fig. 38d).

The conditions requisite for the formation of lamellar pearlite are, therefore: (1) a degree of undercooling that will cause foci to form at points on the original boundaries of the F crystals from about 1250 to about 500×10^{-8} cm., and possibly slightly less apart; (2) a time of cooling from Ar_3' to Ar_1' that will allow the ex-

panding hemispherical surfaces, which enclose those portions of the original crystals that have changed from F to B, to merge and form continuous contracting interfaces (see Fig. 38b); and (3) a rate of diffusion at Ar_1' —whatever its temperature—that will allow carbon atoms to move through F to the regions most remote from the original boundaries of the grains, there to raise the concentration of carbon to the point where carbide will form. It is not improbable, also, that a high linear crystallization velocity is requisite for the formation of well-developed carbide plates.

Once the B interface is continuous (see Fig. 38c), those portions of the grain lying between the interface and the original boundary will consist of B. The thickness of the envelope, which forms before the precipitation of carbide at the B interface prevents its further contraction, will be determined by the time of cooling from Ar_3' to Ar_1' . Thus, to raise the rate of cooling and degree of undercooling is to render more uniform the concentration of carbon in F at the interface.

Formation of Troostite

The conditions essential for the production of a small number of transformation foci are (1) a short time of cooling from Ar_3' to Ar_1' and (2) a relatively high degree of undercooling. Given these conditions, as few as 1, 2, 3, or 4 foci will form per grain boundary.

It will facilitate discussion of these conditions and their effects if the fan-shaped areas in Fig. 40 be considered. At foci on the boundaries of two grains in this diagram transformation of F to B is assumed to have started, and hemispheres of B (represented in section by the white areas in the diagram) to have formed. The surfaces of these hemispheres are B interfaces.

Statistical considerations signify that the atoms of carbon in a given grain of F form a lattice of their

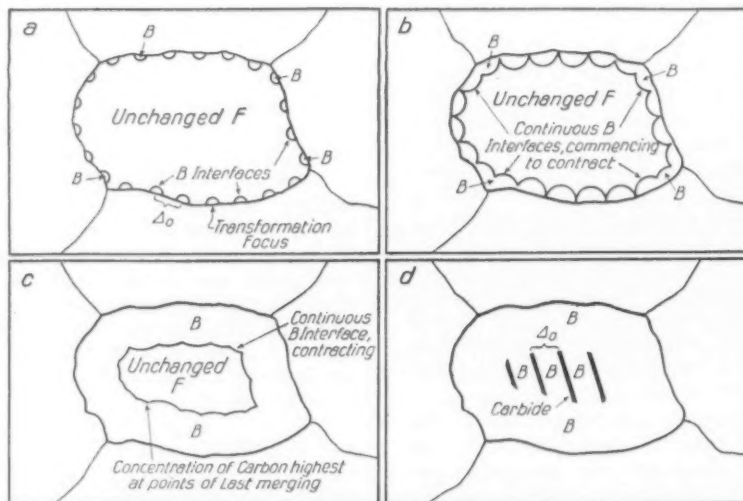


Fig. 38—Diagrammatic representation of formation of pearlite.

own, the unit cube of which is dependent on the carbon content of the steel. When a B interface expands, it may be considered as pushing out into the "carbon lattice." Hence, a reticular arrangement of carbon atoms develops in F in the vicinity of the interface. In other words, the concentration of carbon in F at the B interface is not uniform but varies more or less regularly from point to point near the surface.

A stage is reached in the growth of the interface when, at the points of high concentration, the unchanged F becomes supersaturated with carbon, with the result that nuclei of carbide are precipitated and B is concurrently formed. The precipitation of carbide will prevent further expansion of the B interface.

The space between the interface and the focus (Fig. 40) will now consist of B. Beyond the interface carbon atoms will be diffusing into the unsaturated regions of F from those parts where supersaturation has already caused precipitation of carbide and rearrangement of iron. These atoms of carbon, as they diffuse, will unite with atoms of iron to form more carbide, which will crystallize on the nuclei already precipitated. The reticular arrangement of the nuclei determines that the carbide crystals shall develop from the interface in the form of blades separated from one another at regular intervals. The radial growth of these blades will cease only when the concentration of carbon at the F interface (see Fig. 40) falls to the point where carbide can no longer form.

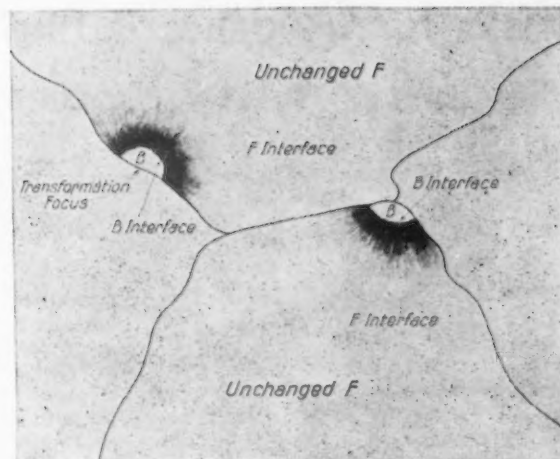
The precipitation of carbide at the B interface prohibits expansion of the interface but permits rearrangement of iron atoms on a body-centered lattice. As fast, then, as the carbide blades develop, the nearby F changes to B. A lamellar structure radiating from the B interface is thus produced.

The focus becomes, then, not merely the center of a hemispherical interface between a kernel of B and a shell of conglomerate, but the center of a shell of conglomerate more or less hemispherical in form. The concentration of carbon within this shell will be uniform, and the conglomerate of which it is formed will be of the metastable eutectoid composition determined by its time, or rate, of cooling. (Fig. 37).

The radial development of carbide has an important effect upon the structure of the conglomerate of carbide and B, which, when viewed under the microscope, generally gives clear evidence—a "fan-like arrangement of the uniformly laminated areas"—of its radial mode of formation. The structure of the conglomerate is that usually referred to as nodular troostite.

The mechanism of formation of nodular troostite in metastable hyper-eutectoid steels is somewhat different from that of the fan-like structures in

Fig. 40 — Diagrammatic representation of formation of troostite.



metastable hypoeutectoid steels. By metastable hyper-eutectoid steels are meant those which, when undercooled, will be characterized by free carbide. For example, the 0.75 per cent carbon steel (cooled from 850 to 350 deg. C. in 350 sec.), would be classed as metastable hyper-eutectoid.

In such steels as these the atoms of carbon moving through the interstices of the F lattice will suffer no hindrance at temperatures above $A_{r_{cm}}$. Here, however, certain of the atoms of carbon will begin to group themselves with atoms of iron at foci within, or at the boundaries of, grains of F to form iron carbide. The foci of carbide differ from those of B in the important respect that they form within, as well as at the boundaries of, grains of F. The number of foci, wherever formed, will be governed by the laws of spontaneous crystallization of undercooled liquids. Diffusion of carbon will bring more and more atoms into contact with the groups

at the foci, so that, as time goes on, more and more carbide will be precipitated.

Provided the rate of diffusion of carbon is low enough, the concentration of carbon in F at the surfaces of the particles of carbide will be reduced until the atoms of iron can rearrange themselves on a body-centered lattice A_{r_1} . F will change to B, and further free growth of the carbide crystal will cease. The transformation of F to B will lead to the formation of carbide wherever the carbon atoms are most highly concentrated. If the atoms of carbon in F have a lattice of their own, lamellar growth of carbide will be ensured, and a "fan-like arrangement of uniformly laminated areas" will be discovered in sections of the metal. The concurrent formation of B and of carbide will, of course, cease when transformation of F to B can no longer continue, owing to concentration of carbon in the F lattice.

Sic Transit

AN old landmark of Wisconsin's pioneer days as an iron producer still stands near Neda, in Dodge County. It consists of two structures, a stone blast furnace and an old red brick blowing house. The early history of charcoal iron production in Wisconsin is obscure, though old tim-

ers in the producing areas insist that Wisconsin iron played an important part in the Civil War.

The stone blast furnace near Neda was evidently erected prior to 1865 at about which time brick was made available. The cornerstone in the brick blowing house bears the date 1865. The furnace was operated by the Wisconsin Iron Co.



Asks for Guidance in High-Temperature Metal Problems

Announcement Made by Joint Committee on Effect of Temperature on the Properties of Metals

THE Joint Research Committee on Effect of Temperature on the Properties of Metals, the agency set up by the American Society for Testing Materials and the American Society of Mechanical Engineers to deal with the field denoted by its name, discussed at its last meeting a problem that is looming large in the eyes of engineers who design, who test, and who use alloys at high temperatures.

The logical base line for high-temperature design, comparable to the tension test for ordinary temperature design, and like it subject to varying factors of safety dependent on the particular type of service, is the stress for a given amount of deformation, determined by tests, each at one constant temperature and one constant load. This requires a family of curves obtained by long-time "creep" tests.

As is usual in the development of a new type of testing, early results were shrouded in uncertainty because it was not clear whether the discrepancies and discordances in the results of different observers were due to inaccuracies in the method of test, such as insufficient realization of the necessity for precise temperature control, too short periods of test, etc., or to real differences in supposedly similar lots of material.

The testing difficulties appear well on the way toward being smoothed out by the promulgation last June of a Tentative Creep Test Code, which summarizes in a few essentials of procedure the experience of the committee members and of those of its many sub-committees. It appears that results of different observers, all adhering to the code, will hereafter show vastly better agreement than some of the older data did, and that the way is thus paved for true appraisal of the actual differences among materials and, in the case of a single material, of the determination of its load-carrying properties. Determination of the spread in load-carrying ability between different lots of material of the same class, so that the designer can intelligently fix "safe loads"—for which the user is clamoring—must await the accumulation of data on lots of known history.

In most cases design cannot wait for this accumulation, so the designer has to make the best guess he can. He knows that the short-time high-temperature tensile test by itself gives high values, which, if they have any real value at all in design for

structures to be subjected to long loading, must certainly be modified by large factors of safety which must increase, as the temperature is increased, and increase to such large magnitudes that the shakiness of the assumptions made becomes self evident. The designer feels more security in having creep values, from say 1000-hr. tests, as a basis for extrapolation to the years of actual service he desires, but at best he must still extrapolate and must, while lacking actual data, make assumptions as to the conformity of the behavior of the material he uses with available data for behavior of other material of that type that has been previously tested.

Pressure is therefore put on the testing engineer to provide quicker returns when a given lot of material is submitted for high-temperature appraisal. The suggestions for short-cuts have been many. They range from the superrefined determination of short-time proportional limit, through deformation measurements carried on for a day or so, "relaxation" tests starting at high loads automatically reduced, other test starting at a high temperature with temperature automatically reduced, through cantilever tests, restrained bend tests, step-up and step-down tests on a single specimen, etc., etc., down to the abandonment of all short cuts and the use of the recognized creep method with the aim of carrying it on only for just the period required to show clearly the future behavior of the material.

Difficulties with the Short-Cuts

Lack of knowledge as to when the test really becomes sufficient makes this aim difficult of fulfillment, especially since the question of metallurgical stability arises, so that another angle of the problem is how to "incite" metallurgical break-down or stabilization, as the case may be, by shortened methods.

Proponents of suggestions for short-cuts normally advocate them primarily for "sighting shots" to reduce the necessary number of creep tests, or for appraisal of the uniformity of a given material from lot to lot rather than as a true foundation for design values, but either the proposer of the short-cut or someone who reads or hears of it ultimately attempts to find some conversion formula by which the short test can be made to tell the long story.

Either some such conversion is pos-

AN important question about the load-carrying ability of metals at high temperatures is here put to industry. It comes from a so-called joint committee on Effect of Temperatures on the Properties of Metals. In brief, the question is, shall the problem of short cuts and extrapolations be attacked? And also, shall three-year creep tests be instituted so that the indications of short tests may be compared with the three-year actualities? A similar plan has been entered upon in England, where full support of it is urged as a British patriotic duty because of advances in research in this particular in other countries. The American plan would appear to provide for periodic correlation of results of progress of all investigators, but the committee wants to know industry's wishes.

sible, or none is. Enthusiasm may lead to adoption of an untrue conversion and resulting disaster on the one hand or wasteful use of metal on the other. Conservatism may lead either to excessive cost of testing by sticking to the old ways or to parsimonious failure to make tests where tests are vitally needed, preferring to take chances than to spend money. Progressive engineers have an open-minded attitude toward accelerated methods but at the same time one that demands engineering proof of, instead of mere hope of, correlation.

The joint committee, in its ten years of existence, has assembled and disseminated much basic information on the relation between high temperature fatigue and creep, the effect of grain size, etc., etc., and on the broad problem of stability of alloys at high temperature, a metallurgical aspect that must always be considered, and has on its immediate program or those of special sub-committees constituted for the purpose of planning, financing and carrying them out, specific problems on specific alloys whose clarification will advance fundamental knowledge.

Three-year Research Instituted in England

A similar joint committee recently formed in England for study of high temperature problems is reported by the British engineering press as in progress of financing, jointly by industry and the government, and on quite an extensive scale, a three-year research program. British editorial comment refers to support of the program as a patriotic duty for the maintenance of British progress against

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Redesigned Internal Grinder Gives Increased Flexibility

INCREASED flexibility and greater ease of handling are secured by recent changes in the No. 81 internal grinder built by the Heald Machine Co., Worcester, Mass. This machine, intended primarily for small work, has a fully automatic grinding cycle, and can be equipped with the company's Size-Matic or Gage-Matic automatic sizing devices or even with a combination of the two. It may be used either as a single-purpose tool on mass production or as a universal tool for a variety of work.

An outstanding new feature is the hydraulically-operated cross-slide. With this, the cross-feed is independent of table reciprocation, which permits selection of exactly the right table speed and the right wheel feed independently of each other, with advantages in accuracy, finish and production.

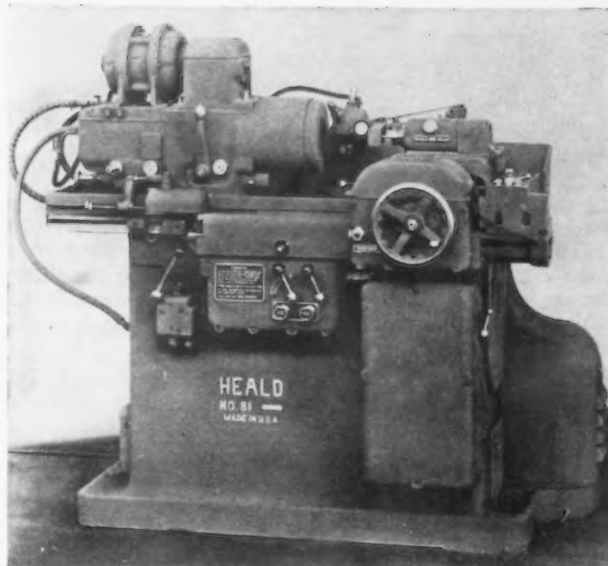
Four feed adjustments are obtainable, although seven distinct functions are performed by the cross-slide during the grinding cycle. These include a pick-up feed as the wheel enters the hole, and a roughing feed that may be set for as many passes of the wheel as are needed before it drops to a fine feed. As the wheel withdraws for truing all feed is stopped. As the hole approaches finish size, practically all the feed is cut off and a spark-out feed is obtained. Finally, as the wheel withdraws from the hole it is backed off, compensation also being made for reduction in diameter of wheel by truing. Where an extremely high finish is not required, the spark-out feed may be eliminated. This speeds up production without affecting the accuracy of the finished hole.

Constant working pressure is maintained at the feed valves, irrespective of the changes in the line pressure, by a reducing valve. In having large valve openings this valve helps eliminate troubles arising from lodging of dirt and foreign matter in the valve.

Separate motor drive for the workhead is now standard, making it convenient to grind either straight or tapered work. The motor is mounted on the workhead and drives the spindle through a belt. An adjustable idler takes up slack. Any one of four different types of workhead motor, single or multiple speed, can be furnished. With a single-speed workhead any one speed from 660 to 1600 r.p.m. is available, and with an adjustable speed workhead all speeds between 500 and 1490 r.p.m. are obtainable.

The fixture-operating mechanism is now hydraulically actuated. As before, three types are available, name-

Hydraulic feed for the cross-slide permits selection of exactly the right table speed and correct wheel feed, independently of each other. Individual motor drive for the work-head is also new.



ly, pull, push and special type for diaphragm fixtures. All are actuated by a small hydraulic cylinder mounted on the back of the workhead, which bears against a lever on the fixture-operating shaft. A valve for operating the fixture is mounted on the front of the machine at the left of the control box. Provision is made for operating the fixture manually when the motor is not running.

Other improvements include operation of the workhead clutch by a hydraulic cylinder controlled by the table. The drive from the motor to the wheelhead idler shaft is now by means of multiple V-belts. The standard water tank is now provided with a swinging drain pipe to facilitate emptying, and a new extra-capacity tank for high-production work has been made available.

Combination Die Head Takes Either Circular or Tangent Chasers

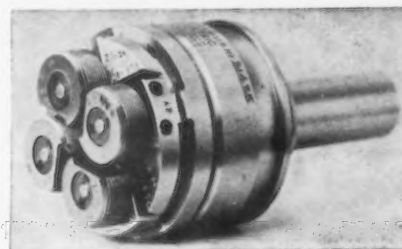
A COMBINATION die head that is hardened and ground throughout and that will take either circular or tangent chasers interchangeably now supplements the line of the Geometric Tool Co., New Haven, Conn. This tool, the result of months of development, is said to have been brought out to make Geometric die head construction avail-

able to those who favor the use of either circular or tangent chasers for long runs of identical threads, or where there is much chaser breakage.

Either style of chaser with its holder can be extracted without removing the die head from the machine, then ground and set and replaced in the head in a minimum of time. The chasers can also be removed from the holders and accurately ground in a new Geometric fixture which is adapted for use on any universal surface grinder.

The circular chaser has a series of

Circular or tangent chasers may be used interchangeably. The combination principle is available in die heads of both rotary and stationary types.



serrations for coarse adjustment, but any desired degree of adjustment between serrations is also provided. The tangent chaser has an equally minute adjustment. In resharpening, only enough metal need be ground off either type of chaser to leave a clean cutting edge, which greatly lengthens the chaser life. A chaser holder support made extremely rigid by heavy T-slots and broad reinforcing rings, a post support for the circular chaser which is integral with the holder, and an improved four-point bearing for the tangent chaser are other improvements.

The principal feature of one of the

company's line of die heads is retained. This is that the front plates that help to form the T-slots which support the chaser holders are removable and replaceable in case of wear—an arrangement emphasized as greatly lengthening the life of the tool. Broad locking surfaces that hold the chasers in the cutting position, positive tripping and adjusting means, and simple provision for disassembling the head for cleaning have also been retained in the new line.

This combination principle is available in die heads of both rotary and stationary types, with the helix either in the chaser or in the holder.

Coiled Stock Straightened and Delivered to Presses

PORTABLE and stationary roll-feeding straighteners for use in connection with power presses of various types have been introduced by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. The principal functions of this machine are to flatten and feed coiled strip stock and to remove the drag of a heavy coil from the roll feed or from the operator, depending upon whether the press is fed automatically or by hand. In addition to assuring flat blanks, advantages claimed include increased production, less scrap, maintaining of constant tension that permits accurate feeding, and the use of larger and heavier coils.

The machine is driven by a constant-speed motor and is self-contained. It has a mechanical speed adjustment which may be set to deliver any specified amount of material to accommodate the feed of the press. An automatic electrical control stops the straightener from feeding when the press is shut down and also when an excess of stock accumulates between the press roll feed and the straightener. The same control starts the straightener again when the press is started and when the excess stock

condition is corrected. If the press is run intermittently the straightener functions accordingly, thus maintaining a uniform tension on the roll feed of the press.

Three sizes are made for straightening stock up to 3/64 in. thick, 4 in. wide; 1/16 in. thick, 8 in. wide; and 1/10 in. thick, 12 in. wide respectively. The machine can be used with roll feed and hand feed pillar and open-back presses, and also with double-action, transfer, cut-and-carry, and follow tool presses. Stationary types of the straightener have been used in connection with a two-post hand feed blanking press and with a special horizontal press fitted with compound tools for the production of extra flat blanks, such as required for condenser plates, clock plates and gears, typewriter and electrical instrument parts and the like.

Electrode for Welding Cast Iron

WELDING procedure is simplified and welds having greater strength and ductility than the par-

ent metal are said to be produced by a new electrode brought out by the Lincoln Electric Co., Cleveland, for welding cast iron by the shielded arc process.

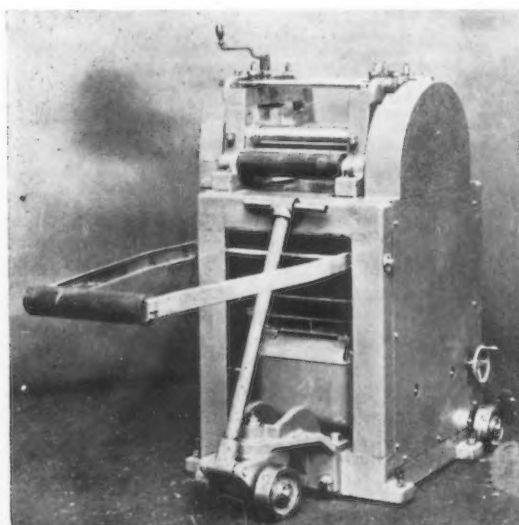
This electrode, designated as the Ferroweld, has a steel core surrounded by a heavy flux coating which protects the arc from atmospheric gases injurious to the weld. An outstanding feature is the low heat with which it can be used, thus reducing the possibility of cracking. The electrode is manufactured in the 1/8-in. size only and is used with approximately 80 amp. of current.

Welding is done intermittently. Not over a 3-in. bead is laid down at one time, and as each bead is laid it is peened lightly, thoroughly cleaned and permitted to cool somewhat before the next bead is deposited. It is stated that because of the extremely low current used, the hardening effect ordinarily present along the line of fusion is materially reduced, and thus the weld is more machinable than most cast iron welds.

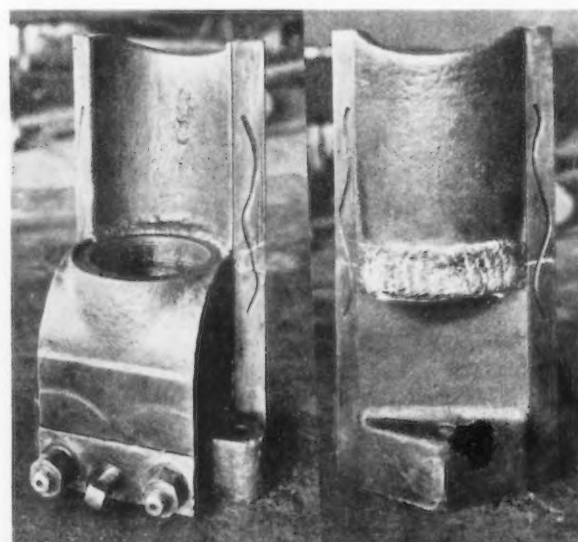
The illustrations show a weld made on a punch press ram with Ferroweld. The ram is about 22 in. wide and approximately 1 1/2 in. thick at the break. The press in which it is employed is in constant use for punching holes as large as 7 in. in diameter in No. 10 gage steel.

The ram was broken at the point indicated by the chalk mark at the right of the weld.

In repairing it a vee about 2 in. wide was cut at the back, leaving approximately 1/4 in. of metal at the bottom of the vee. The part was then tack welded at the inner ends of the chalk marks. Short beads were laid intermittently along the line of the break, first on one side of the ram and then on the other. After the welding the outside flanges of the ram which fit in the guides were ground down. There were no signs of cracking or pulling away in the weld. No checks were present.



(At left): Portable roll-feeding straightener designed to flatten and deliver coiled strip stock to power presses. Stationary models are also built.



(At right): Broken punch press ram repaired by shielded arc welding with the new Ferroweld electrode for cast iron.



THE NEWS OF THIS WEEK

Employee Representation Making Rapid Progress

SINCE the enactment of the National Industrial Recovery Act, the number of companies that deal with their workers through employee-representation plans has increased 180 per cent, and the number of companies that have trade-union agreements with their employees has increased 75 per cent, according to the results of a nation-wide survey of employer-employee relations in manufacturing and mining industries conducted by the National Industrial Conference Board. This survey was undertaken for the purpose of ascertaining to what extent and in what manner industrial wage-earners have availed themselves of the right to bargain collectively with their employers through representatives of their own choosing, which is guaranteed to them under Section 7-a of the Recovery Act.

Reports received from 3314 concerns employing 2,585,740 wage-earners, or 27 per cent of all employed in manufacturing and mining industries, showed that 2284 companies, employing 1,013,016 workers, dealt individually with their employees; 653 companies, employing 1,164,294 workers, had some form of employee representation; and 416 companies, employing 240,866 workers, had trade-union agreements. A few companies combined individual and collective dealing.

An analysis of the returns revealed that only 11.6 per cent of the employee-representation plans had been introduced before 1920, while 40.9 per cent of the trade-union agreements dated back to the war period.

By size of company, the returns showed that individual bargaining was practised generally in the smaller companies, averaging less than 500 employees each; trade-union agreements were more common in the medium-size companies, averaging about 800 employees, and employee-

representation plans were used generally in the larger companies, averaging over 1500 employees.

Employee-representation plans predominated in metal mining, metal working, rubber products, and petroleum refining, while trade-union agreements were most prevalent in clothing, printing and publishing, stone, clay and glass, textiles, and coal mining.

Of 652 employee-representation plans reported, 54.1 per cent were of the employee-committee type, in which the employee representatives meet by themselves and confer with the management only when some matter is to be negotiated; 34.2 per cent were of the joint-committee type, in which the employee representatives meet with the management representatives, the two groups usually being equal numerically; and 9.7 per cent were a combination of these types, the employee representatives meeting sometimes by themselves and sometimes with the management representatives. Only three companies, employing less than 2000 workers, reported using the so-called Industrial Democracy plan, a type modeled on the Federal political system, with a cabinet, senate, and house of representatives.

Steel Institute Names New Secretary

L. V. COLLINGS, New York attorney, has been appointed secretary of the American Iron and Steel Institute, to succeed George H. Charls who resigned Nov. 15, 1933. Mr. Collings has practised corporation law in New York since 1926. He was graduated from Colgate University in 1916 and represented a large oil company in China from 1916 to 1923. In 1926 he was graduated from Harvard

Law School. Mr. Collings began his new duties on Jan. 15.

The directors of the institute have also appointed Alexander Baxter and George Satterthwaite as special investigators, as part of the program of the code authority for enforcement of the provisions of the code. Mr. Baxter formerly was a partner in a firm of certified public accountants and Mr. Satterthwaite was recently vice-president and general manager of Henry Disston Sons, Inc., Philadelphia.

In announcing this step, W. S. Tower, executive secretary, said that the duty of the investigators "shall be to assist the administrative committee in seeing that the members of the code perform their obligations thereunder, including the investigation of all alleged violations of the provisions of the code which may be reported."

Frank Purnell, president, Youngstown Sheet & Tube Company, Youngstown, and Samuel E. Hackett, vice-president, Jones & Laughlin Steel Corp., Pittsburgh, chairmen respectively of the labor and commercial committees have been appointed to the general administrative committee of the board of directors of the institute, which is the steel code authority.

Cost of Living In December

THE decline in the cost of living of industrial wage-earners, which began with a drop of 0.3 per cent in November after six months of steady advance, continued in December with a further drop of 0.6 per cent, according to the regular monthly survey of the National Industrial Conference Board. Total living costs were 22.8 per cent lower than in December, 1929, but 2.9 per cent higher than in December, 1932.

The purchasing value of the wage-earner's dollar, in terms of the base 1923=100c., was 129.4c. in December, as compared with 128.5c. in November and 139.9c. in April.

Gray Iron Founders Society Elects Officers and Directors

CLEVELAND, Jan. 11.—Directors of the Gray Iron Founders Society, sponsors of a code for gray iron jobbing foundries, met here today and elected the following officers: President, Franklin R. Hoadley, Farrell-Birmingham Mfg. Co., Inc., Ansonia, Conn.; vice president, C. B. Magrath, Northwestern Foundry Co., Chicago; secretary, Walter H. Cole, Moore Brothers Co., Elizabeth, N. J., and treasurer, R. D. Phelps, Francis & Nygren Foundry Co., Chicago.

Empowered by the code which is in the executive department of NRA awaiting final approval, the directors chose six members of the code authority who with two representatives to be selected by non-members of the Gray Iron Founders Society will compose the administrative body. The society representatives are as follows: Franklin R. Hoadley; C. B. Magrath; W. A. Rigsby, Lombard Iron Works & Supply Co., Augusta, Ga.; A. B. Root, Jr., Hunt-Spiller Mfg. Corp., Boston; George Branstion, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., and W. H. Winters, American Brake Shoe & Foundry Co., Pittsburgh.

As soon as the code is approved means will be provided for non-members of the society to choose their representatives.

The new directors of the Gray Iron Founders Society are as follows:

Ronald Kucher, Olymple Foundry Co., Seattle, Wash.; A. J. Muhlbach, Vernon Foundry Co., Hollydale, Cal., District No. 1, Washington, Oregon, Idaho, Montana, California, Utah, Arizona, Nevada.

A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis., District No. 2, Minnesota, North Dakota, South Dakota, Wyoming, Wisconsin, Nebraska.

Kenneth L. Green, Green Foundry Co., St. Louis, Mo., District No. 3, Colorado, New Mexico, Kansas, Missouri.

C. B. Magrath; R. D. Phelps, District No. 4, Iowa, Northern Illinois, Northern Indiana.

George Branstion, Muskegon, Mich., District No. 5, Michigan.

Walter L. Seelbach, Forest City Foundries Co., Cleveland, Ohio, District No. 6, Northern Ohio.

A. H. Kramer, Advance Foundry Co., Dayton, Ohio, District No. 7, Southern Indiana, Southern Ohio, Kentucky.

W. H. Winters, general superintendent foundries, American Brake Shoe & Foundry Co., 2680 Preble Ave., Pittsburgh, Pa., District No. 8, Western Pennsylvania, West Virginia and Garrett and Allegheny Counties of Maryland.

N. H. Schwenk, Cramp Brass & Iron Foundries Co., Paschall Station, Philadelphia, Pa., District No. 9, Eastern Pennsylvania, Southern Jersey, Delaware, District of Columbia, Maryland (except Garrett and Allegheny Counties).

Robert E. Dillon, Lake Erie Engineering Corp., Buffalo, N. Y., District No. 10, Western New York, Erie County, Pa.

A. B. Root, Boston, Mass., District No. 11, Massachusetts, Rhode Island, Maine, New Hampshire, Vermont.

Franklin R. Hoadley, Ansonia, Conn., District No. 12, Connecticut, Eastern New York.

Walter H. Cole, Moore Bros. Co., Elizabeth, N. J., District No. 13, Northern New Jersey, Section of Northeastern Pennsylvania.

Arthur E. Hartwell, Hartwell Iron Works, Houston, Tex., District No. 14, Texas, Oklahoma, Arkansas, Louisiana.

W. A. Rigsby, Lombard Iron Works & Supply Co., Augusta, Ga., District No. 15, Mississippi, Alabama, Tennessee, Georgia, Florida, North Carolina, South Carolina, Virginia.

The directors mentioned were nominated by a committee composed of H. S. Washburn, Plainville Castings Co., Plainville, Conn.; William J. Grede, Liberty Foundry, Inc., Wauwatosa, Wis.; A. W. Lemme, Elizabeth Street Foundry Co., Chicago, Ill.; W. A. Rigsby, Lombard Iron Works & Supply Co., Augusta, Ga., and S. H. Standish, G. H. R. Foundry Co., Dayton, Ohio.

Members of the finance committee chosen by the board of directors of the society include R. D. Phelps, C. B. Magrath, W. H. Winters, A. C. Ziebell and Kenneth L. Green. A membership committee has been formed consisting of the following: Robert E. Dillon, chairman, W. L. Seelbach, Walter H. Cole, N. H. Schwenk and A. H. Kramer.

New President Has Colorful Background

Franklin R. Hoadley, newly elected president of the Gray Iron Founders Society, has been identified with the Farrell-Birmingham Mfg. Co., Ansonia, Conn., and with its predecessor firm since his graduation from Yale in 1914. He was born in Ansonia in 1890 and received his elementary education at Hill school, Pottstown, Pa. He became connected with the Farrell Foundry & Machine Co., Ansonia, as foundry apprentice in 1914. During the war he was in the service as lieutenant in the ordnance department stationed in Buffalo and later overseas. On his return and discharge from the army, Mr. Hoadley was re-employed by the Farrell company as foundry manager in 1919. He was elected a director in 1923 and on the merger with the Birmingham Iron Foundry Co., Derby, Conn., in 1927, became a director of the newly formed Farrell-Birmingham Foundry & Machine Co., Inc., manufacturer of heavy machinery, operating plants in Ansonia, Derby and Buffalo. He was made vice president in 1930, a position which he still occupies.

Mr. Hoadley has been active in civic affairs, is a director of the Birming-

ham National Bank, Derby, Conn., served as an alderman in Ansonia for two years, is chairman of the National Reemployment office for a number of towns in Connecticut and is a member of the C.W.A. district committee. He is a member of the American Foundrymen's Association, a major in the ordnance reserve, a member of the Army Ordnance Association and serves on the administrative council of the National Founders Association.

F. I. T. Practices To Be Arbitrated

IN an effort to eliminate certain abuses which have grown up in the structural steel industry, the American Iron and Steel Institute, through its traffic committee, has petitioned the railroads asking them to make a ruling requiring all bills of lading to be stamped with the final destination of material to be fabricated in transit. This stamping would "earmark" the specific material used in the job.

Inasmuch as the proposed method would probably be a distinct disadvantage to the fabricating companies, the American Institute of Steel Construction, Inc., has appointed a committee to confer with the committee representing the American Iron and Steel Institute, to reach some agreement which will be satisfactory to all. In the meantime action by the railroads on the proposed amendment to the rule is suspended.

The committee representing the steel construction institute consists of R. C. Mahon, R. C. Mahon Co., Detroit, chairman; H. B. Hirsh, Belmont Iron Works, Philadelphia; J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind.; H. A. Fitch, Kansas City Structural Steel Co., Kansas City, Kan., and H. S. Dance, Virginia Bridge & Iron Co., Roanoke, Va.

Scrap I. & S. Institute Gains Members

THE following new members were admitted to the Institute of Scrap Iron & Steel during the past week, it was announced today by Benjamin Schwartz, director general of the Institute: M. N. Landay Co., Pittsburgh; J. Fingeret & Son, Ambridge, Pa.; H. F. Stocker & Co., Pittsburgh; Pennsylvania Iron & Steel Co., Pittsburgh; I. W. Solomon, Pittsburgh; H. N. Trimble, Pittsburgh; Jay G. Stephens Corp., Pittsburgh; United Iron & Metal Co., Pittsburgh; Butler Iron & Steel Co., Butler, Pa.; Union Shipbuilding Co., Baltimore, Md., and Jacob Barowsky, Fitchburg, Mass.

Representation Plans Foster Concord Rather Than Antagonism, Says Teagle

EMployee representation plans constitute a departure from traditional employer-employee relations, because they are based on a philosophy of cooperation and mutual interest, declared Walter C. Teagle, chairman, industrial relations committee, Business Advisory and Planning Council for the Department of Commerce, in a recent public statement.

"Before the beginning of modern industry the relations of employer and employee were those of master and servant," he pointed out. "Growth of the factory system and other forms of employment accentuated class differences between the two groups and sharpened the feelings of rivalry and hostility which often set them against one another."

"To secure a larger share of the gains of industry and protect themselves from oppressive measures, workers a long time ago began to band themselves in unions. The philosophy and methods of these organizations were molded in the dissatisfaction from which they took their origins. Thus, unionism is partly a result and partly a cause of the conflict of interest which too often has set workers and management against one another, resulting in a test of strength through strikes involving loss to both parties."

"Alongside this philosophy of conflict there has grown up in recent years recognition by management and workers of the desirability of cooperation; a better conception of the interests of labor and capital as being essentially mutual and not antagonistic. Those who have accepted this theory have tried to find methods of collective bargaining whereon employers and employees might agree and avoid conflict, in which they would unite to further their own mutual interest as well as the welfare of the business in which they are engaged and the rights of the public."

Concord, rather than conflict, is promoted by employee representation plans because they encourage the early settlement of disputes in the shop or department in which they originate, Mr. Teagle asserted. Such plans are organized on a company basis and, therefore, are freed of the friction that frequently develops between craft unions—the so-called jurisdictional strife which, by tying up whole plants with strikes, penalizes neutral crafts, as well as the management, though they are entirely innocent either of provoking the trouble or championing either side after it has arisen. In contrast, employee representation, Mr. Teagle says, "insures representation of all em-

ployees by their own associates who understand their local craft problems, and avoids jurisdictional disputes between two crafts in the same organization. Unity of action in all departments is assured through conferences at which every employee is represented. There is no record of any case where representation has been made use of by racketeers at the expense either of the employee or the employer."

Employee representation, Mr. Teagle emphasized, "settles local problems without getting involved in outside complications. . . . It holds that joint consideration of problems should be the first step, not the last; that it is better to investigate facts and compare points of view before issues have been sharply drawn and commitments made from which either side finds it difficult to recede."

Employee representation plans and trade unions are not mutually exclusive, according to Mr. Teagle. "On many councils union members, who for one reason or another keep their cards, work harmoniously with non-union representatives. The wise employer has made no effort to weaken the status of unions in his business. As a matter of fact, in many plants where this form of collective bargaining has been used, unionism has not been an issue. In such plants the workers' experience with industrial representation through good years and bad makes them indifferent to efforts to organize them into craft unions because they can see no gains over their present arrangement. They view their jobs in terms of the finished products rather than as a particular trade operation incident to their production, such as welding or carpentering. With many different crafts employed in the manufacture of a single line of products, it has not proved feasible to affiliate with several outside union organizations having different interests. Hence, one particular group cannot call a strike to the injury of other groups having no direct interest in the claims of the local union precipitating the trouble."

New Industrial Oven and Air Conditioning Co.

SMITH-MAYER CORPN., Cleveland, has been organized by James Campbell Smith and C. F. Mayer, to engineer and manufacture industrial ovens, conveyors, air heaters, air conditioning and allied equipment. Mr. Mayer has severed his connection with the Foundry Equipment Co., Cleveland, of which he was vice-president,

to devote his time to the new industry. Formerly he was manager of the oven business of the Swartwout Co., Cleveland, and Mr. Smith was associated with him, having been Pittsburgh manager of the Swartwout company for a number of years. Later Mr. Smith was manager of the Detroit district for the McCann-Harrison Corp., Cleveland. During the past three years he has been designing and building industrial ovens, conveyors, air heaters, etc., under his own name. During the past 15 years Mr. Smith and Mr. Mayer in their various connections have been associated in the engineering and installation of many large core and mold drying, japanning, lacquer drying and general drying and conveying systems.

A Surprising Decision By Trade Commission

WASHINGTON, Jan. 16.—The Federal Trade Commission today made public its decision ordering the Vanadium Alloys Steel Co., Latrobe, Pa., to divest itself of the outstanding capital stock of the Colonial Steel Co., Pittsburgh. The commission held that the Vanadium company acquired the stock in violation of Section seven of the Clayton Act. The section prohibits acquisition by a corporation of the stock of another corporation where the effect may be to substantially lessen competition or tend to create a monopoly. Both the Vanadium and Colonial companies make tool steel. The commission said its complaint was based on Vanadium's acquisition of the entire outstanding common (voting) capital stock of the Colonial company which then consisted of 32,000 shares of common stock of the par value of \$100.

Announce Meetings To Interpret Steel Code

MEETINGS for members of the iron and steel code will be held at the Duquesne Club in Pittsburgh Jan. 23 and at the Hotel Benjamin Franklin in Philadelphia Jan. 24, according to an announcement by Walter S. Tower, executive secretary of the American Iron and Steel Institute. The meetings will be similar to those being held this week in Chicago and Cleveland for the purpose of explaining and interpreting any points of the terms and provisions of the steel code which members may want to have cleared up.

Attendance at the meetings will be strictly limited to accredited representatives of the members of the code. Mr. Tower will preside at the meetings and answer questions of the members.

British Steel Hampered By Fuel Shortage

LONDON, ENGLAND, Jan. 16 (*By Cable*).—The tendency of British blast furnace activity to increase is being hampered by a shortage of fuel, accompanied by increasing fuel prices. As a result, iron masters are declining forward contracts until such time as official prices are reviewed.

Semi-finished steel mills are, in general, working at full time, with heavy steel demand improving and additional plant capacity in sight. British steel prices, however, may be influenced by the increasing cost of scrap. The United States has been reported as shipping between 3000 and 4000 tons of scrap to the United Kingdom.

Tin plate is steadier in price on renewal of inquiry, but orders still are small, with the result that January output, with a number of mills idle, will probably run under 50 per cent of capacity.

Continental Wire Rod Cartel has fixed the quota for the first quarter at 320,000 tons. Participating countries in International Ship Plate Car-

tel will supply their own domestic requirements, while export orders are to be divided with 25 per cent for the United Kingdom and 75 per cent for Belgium, France and Germany.

December exports of pig iron from the United Kingdom totaled 11,000 tons, of which nothing was shipped to the United States. Total exports of iron and steel amounted to 175,000 tons.

British prices are no longer being quoted for black sheets made to Japanese thin specifications, and Continental prices on black sheets No. 31 gage Japanese have been withdrawn.

Dates Set for Steel Exposition

THE 1934 convention and iron and steel exposition of the Association of Iron and Steel Electrical Engineers will be held at the Cleveland Public Auditorium, Cleveland, on Sept. 18 to 20 inclusive. There were about 60 exhibitors at the 1933 exposition, and floor plans are now being mailed to members and manufacturers of steel mill equipment in order that a larger number may plan demonstrations and exhibits for the 1934 show.

Ore Problems Discussed By Ukrainian Society

CHARKOV, U. S. S. R., Dec. 19, 1933.—The second annual convention of the Ukrainian Scientific Society, representing some 2700 engineers and technicians employed in metallurgical plants, took place in this city on Dec. 6 to 9. A good many statistics were adduced to show expansion in production, much along the lines of the figures issued a short time ago by the State Planning Commission of the Soviets. Emphasis was placed on the successful manufacture of chromenickel, chrome-molybdenum and vanadium steels and the making of ferroalloys in electric furnaces. The trend of works management was stated to be the mechanization of processes to increase further the labor productivity.

Engineer Weiser, of the Steel Trust, so called, Charkov, and Engineer Bariban, of the Institute of Transport Engineers, Moscow, read a paper on the measures to be taken to prevent the freezing of ore in transport. One suggestion was to sprinkle lime or salt upon the ore to an amount of 1.5 to 2 per cent; another was to construct heated buildings at the works

so that the ore may be warmed before unloading is attempted.

Professor Rubin presented a paper on iron ore classification and its preparation before charging into the blast furnace. The ore beds of Krivoy Rog, designated as the richest in the world, call, he said, for three groupings: one of pieces of 80 to 50 mm. diameter; another of pieces from 50 to 25 mm. diameter, and the third requiring agglomeration of 25 to 5 mm. diameter. As a result of control of size, it was claimed that blast furnace output would rise 20 to 25 per cent.

T. T. Shleifer, vice-president of the Steel Trust, was elected president of the Society, succeeding A. S. Tochinsky, who has been appointed chief engineer of the general management of the metallurgical industry in Moscow.

Metal-Working Activity is Lower

WASHINGTON, Jan. 12.—Activity in the metal-working industries during November, as measured by the various data collected by the Bureau of the Census, was generally lower, the one exception being steel furniture, for which new orders were slightly higher. Shipments of steel barrels declined sharply, as did orders for steel boilers and fabricated steel plate. Production of malleable castings was off slightly and orders for steel castings were lower.

New orders for steel furniture, including shelving, fireproof safes and lockers, amounted to \$864,606 in November, compared with \$800,401 in the preceding month and with \$557,053 in November, 1932.

November steel barrel shipments numbered only 582,299 barrels, compared with 789,474 in October and with 376,647 in November, 1932.

Steel boiler orders amounted to 286,479 sq. ft. in November, as against 427,121 sq. ft. in the preceding month and 315,652 sq. ft. in November of last year.

Bookings of fabricated steel plate totaled 14,466 tons in November, 17,839 tons in October and with 7873 tons in November, 1932.

Malleable castings production in November was 21,903 tons, compared with 24,381 tons in October and with 13,622 tons in November, 1932.

The operating rate of steel companies having 98.1 per cent of the capacity of the industry will be 34.2 per cent of the capacity for the week beginning Jan. 15, compared with 30.7 per cent one week ago and 34.2 per cent one month ago, as indicated by telegraphic reports to the American Iron and Steel Institute on Monday.

British Prices, f.o.b. United Kingdom Ports

| Per Gross Ton | | | |
|---------------------------------------------|-----------|--------------|-----|
| Ferromanganese, export | \$9 | | |
| Billets, open-hth. | \$5 10s. | to \$5 12s. | 6d. |
| Black sheets, Japanese specifications | \$11 | | |
| Tin plate, per base box | 16s. | to 16s. | 6d. |
| Steel bars, open-hearth | \$7 17½s. | to \$8 7½s. | |
| Beams, open-hth. | \$7 7½s. | to \$7 17½s. | |
| Channels, open-hearth | \$7 12½s. | to \$8 2½s. | |
| Angles, open-hearth | \$7 7½s. | to \$7 17½s. | |
| Black sheets, No. 24 gage | \$9 5s. | | |
| Galvanized sheets, No. 24 gage | \$11 5s. | to \$11 15s. | |

Continental Prices, f.o.b. Continental Ports

| Per Metric Ton, Gold £ | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|--|
| Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange. | | | |
| *Ingots | \$2 5s. | | |
| *Billets, Thomas | \$2 7s. | | |
| Wire rods, No. 5 B.W.G. | \$4 10s. | | |
| Black sheets, No. 31 gage, Japanese | \$11 5s. | | |
| *Steel bars, merchant | \$3 2s. | 6d. | |
| *Sheet bars | \$2 8s. | | |
| Plates, ¼ in. and up | \$4 1s. | 6d. | |
| *Plates, ½ in. and 5 mm. | \$4 3s. | 6d. | |
| *Sheets, ½ in. | \$4 8s. | 6d. | |
| *Ship plates | \$4 10s. | | |
| *Beams, Thomas | \$2 19s. | | |
| *Angles (basis) .. | \$3 2s. | 6d. | |
| Hoops and strip steel over 6-in. base | \$3 17s. | 6d. | |
| Wire, plain, No. 8 .. | \$5 7s. | 6d. | |
| Wire nails | \$5 15s. | | |
| Wire, barbed, 4-pt. No. 10 B.W.G. .. | \$8 15s. | | |

*Prices as established by European Raw Steel Cartel.

Continental Mills Seek Russian Orders with Credit Inducements

HAMBURG, Jan. 5 (By Special Correspondence).—The Polish-German steel industry agreement has been the first step toward a joint Continental frontier arrangement looking to orders from Russia. It is no secret that the Russians obtained their extremely satisfactory conditions of payments up to 28 months of credit in installments only because they played one country against the other. The Polish-German and the Saar-Luxembourgian industries have agreed to grant Russia, as maximum credit, 14 months in installments so that one-sixth is paid every second month, and Czechoslovakia has now joined this agreement. There is little doubt that France will follow, as Belgium granted this condition when the last contract was placed in November for 15,000 tons of plates. The only country remaining outside would then be Austria, but her capacity is small.

Operations Higher on Continent

Steel works operations on the Continent in the first week of December in percentages of capacity by countries, compared with the corresponding week of 1932, were as follows:

| Country | Percentage of Capacity 1933 | 1932 |
|----------------------|-----------------------------|------|
| France | 73 | 69 |
| Belgium | 64 | 74 |
| Luxembourg | 68 | 66 |
| The Saar | 69 | 56 |
| Germany | 48 | 31 |
| Czechoslovakia | 37 | 52 |
| Austria | 38 | 33 |
| Hungary | 54 | 41 |
| Italy | 78 | 68 |
| Sweden | 62 | 48 |
| Poland | 28 | 41 |

Wire Rod Cartel Threatened

The existence of the international wire rod cartel is endangered by the keen competition of the Société Franco Belge d'Avers, which recently increased its capacity for rods to 3000 tons monthly and of wire nails and wire to 1500 tons monthly. Although the quantity is small compared with the total capacity of the members of the cartel, the competition has been strong enough to force the cartel to reduce prices and to allow certain members to sell at free prices.

French Exports of Iron and Steel

French exports of iron and steel products during the first nine months of 1933 amounted to 1,920,578 metric tons. In this total were included 133,132 tons of pig iron; 237,232 tons of ingots, blooms, billets and slabs; 5146 tons of ferroalloys; 893,060 tons of bars; 28,320 tons of tin plate; 85,187 tons of hot and cold-rolled strip; 100,512 tons of wire rods; 48,591 tons of wire; 109,081 tons of rails; 109,407

tons of plates; 59,638 tons of pipe; 763 tons of hot-rolled, full finished sheets; 5 tons of silicon sheets; 630 tons of tool steel; 3192 tons of wire wheels and wheel centers; 106,026 tons of cast iron manufactures; 472 tons of special steels, and 184 tons of recipients.

Fastest Train

The steam vs. electric locomotive and Diesel rail car controversy has been settled in Germany, at least for the next 5 years, by economic results. The fastest train in the world, the "Fliegende Hamburger," which covers the 301 km. between Berlin and Hamburg in 2 hr. and 12 min. from station to station with a maximum speed of 162 km. an hr., has been operated during the past six months at an average net profit of 377 M. a journey with all overhead charges deducted. The express steam train covering the 301 km. in 2 hr. and 48 min., with a maximum speed of 141 km. an hr., was operated at a loss of 802 M. a trip. Express trains will be substituted within one year by Diesel rail cars with Maybach-Zeppelin motors, except in South Germany, where cheap hydroelectric power permits very quick running. Recently an electric passenger train reached a maximum speed of 152 km. an hr.

The body and frame and most of the vital parts of the new Maybach motors for the German Zeppelin Nr 128, which will be larger than the Macon, and will be put on regular service between Germany, Spain, Brazil and Argentine next spring, will be of stainless steel of the Nirosta type.

Employment in Steel Industry is Sustained

WITH operations averaging 27 per cent of capacity during November, the iron and steel industry gave employment to 90 per cent of the total number of employees on its payroll list, according to an American Iron and Steel Institute report covering employment, hours and wages in the industry for the four weeks ended Dec. 2. It pointed out that even during boom times, the proportion of people actually at work to the total number attached to the industry does not exceed 95 per cent and the present record is due to the spread-the-work program of the industry adopted early in the depression and intensified by the steel code.

Employment in the industry during the stated period declined 4.19 per cent compared with a drop in output of 27 per cent. Total payrolls amounted to \$32,672,000 compared

with \$37,977,000 one month before. The total number of employees at the beginning of December was 399,369 compared with 416,277 in October but an increase of 18 per cent over the total for last June. Average hours per week worked during the month amounted to 27.8 compared with 31.2 hr. per week in October.

Average earnings per hour for employees in the industry amounted to 65.9 cents compared with 64.8 cents in October and 53 cents in June. The increase in average earnings per hour was due to increases under the steel code and changes from the 10-hr. to the 8-hr. day. The report showed further marked reduction in the number of men working more than the average of 40 hr. a week and who exceeded 48 hr. and 6 days a week. This showing, it was pointed out, is due to compliance with the steel code, as well as to the reduced rate of operations.

Ryerson to Sell Inland Piling

INLAND STEEL CO., Chicago, announces that Joseph T. Ryerson & Son, Inc., has been appointed exclusive selling agent for steel sheet piling in the States of Ohio, West Virginia, Pennsylvania, New York, New Jersey, Maryland, Delaware, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, Maine, Kentucky and the District of Columbia.

Detroit Employment Up 44,000

DETROIT'S industries on Jan. 1 were employing 201,000, a gain of 44,000 over a year ago. In a bullish mood automobile executives privately are predicting that because of recent production delays and because of the pent-up demand for motor cars the manufacturing peak this year will extend into the summer as in did in 1933. The recent releases by automobile companies, particularly the Ford Motor Co., have given sharp impetus to production of automotive parts manufacturers. The Briggs Mfg. Co. is operating its stamping division three shifts a day, seven days a week, and its body plants are expected soon to go from two shifts to three shifts. Other parts makers have speeded up output to meet rush delivery schedules of customers.

ERRATUM

The photograph designated as J. M. Gillespie, vice-president of the Lockhart Iron & Steel Co., McKees Rocks, Pa., in THE IRON AGE of Jan. 4, page 49, was that of T. J. Gillespie, president of the Lockhart company. THE IRON AGE regrets the transposition of cuts in its files.

Deductions Authorized in Delivered Prices of Pig Iron Shipped by Water

THREE new commercial resolutions were approved by the directors of the American Iron and Steel Institute on Jan. 11. Commercial resolution No. 43 allows certain deductions in delivered prices of pig iron shipped by water or by rail and water.

A deduction of not more than 60c. a gross ton is allowed on lots of 400 gross tons or more to be delivered by water or rail and water f.o.b. barge alongside dock at any port on the Ohio, Monongahela or Allegheny Rivers between and including Wheeling, W. Va., on the Ohio, Monessen, Pa., on the Monongahela and Ford City, Pa., on the Allegheny. However, in no case may the delivered price on such iron be less than the published base price at the nearest basing point plus 50c. a gross ton.

Deductions of \$1.35 a gross ton on pig iron delivered at Saginaw, Mich., and of \$1.50 delivered at Muskegon, Mich., are allowed on purchases of lots of 1500 tons or more for water or rail-and-water shipments except when the purchasers require that the iron be moved in vessels which they themselves provide. In such cases additional deductions not to exceed 50c. a gross ton for delivery at Saginaw, Mich., or \$1.15 a gross ton for delivery at Muskegon may be made.

A deduction of not more than 60c. a gross ton is allowed on purchases of lots of 400 gross tons or more delivered by water or water and rail f.o.b. barge or vessel alongside dock at Phillipsdale, R. I., Branford and Bridgeport, Conn., Yonkers and Brooklyn, N. Y., and Elizabethport, Roebling, Burlington, and Florence, N. J.

COMMERCIAL RESOLUTION No. 43

Effective Jan. 18, 1934

Preamble and Resolution Adopted by the Board of Directors Jan. 11, 1934, with Regard to Reductions in the Delivered Prices of Pig Iron Delivered by Water or Rail-and-Water Transportation.

WHEREAS it is provided in Section 4 of Schedule E of the code that, in any case in which a product shall be delivered by other than all-rail transportation, the member of the code selling such product may allow to the purchaser a reduction in the delivered price otherwise chargeable under said Section at a rate which shall have been previously approved by the Board of Directors and filed with the Secretary; and

WHEREAS it has been recommended to the board that it approve rates of reductions in delivered prices of pig iron delivered by water or rail-and-water transportation at certain ports on the inland waterways, the Great Lakes and the North Atlantic seaboard;

RESOLVED that the board hereby approves reductions in the delivered prices of pig iron delivery by water or rail-and-water transportation in the cases, at the rates and subject to the conditions hereinafter in this resolution set forth, viz.:

1. In any case in which any purchaser shall purchase from any member of the code pig iron in an amount of 400 gross tons or more and shall require that such pig iron be delivered by water or rail-and-water transportation in a lot or lots of 400 tons or more f.o.b. barge alongside the dock of such purchaser at any port on the Ohio River, the Monongahela River or the Allegheny River between and including Wheeling, W. Va., on the Ohio River, Monessen, Pa., on the Monongahela River and Ford City, Pa., on the Allegheny River, such member of the code may allow a reduction in the delivered price of such pig iron otherwise chargeable under Section 4 of Schedule E of the code in an amount which shall not exceed 60c. per gross ton of such pig iron so delivered; provided, however, that the delivered price of such pig iron so delivered shall not in any case be less than the published base price of such member of the code for such pig iron then in effect at the basing point nearest in terms of all-rail freight charges to the place of delivery of such pig iron plus 50c. per gross ton of such pig iron.

2. In any case in which any purchaser shall purchase from any member of the code pig iron in an amount of 1500 gross tons or more and shall require that such pig iron be delivered by water or rail-and-water transportation in a lot or lots of 1500 gross tons or more f.o.b. barge or vessel alongside the dock of such purchaser at Saginaw or Muskegon, Mich., such member of the code may allow a reduction in the delivered price of such pig iron otherwise chargeable under Section 4 of Schedule E of the code in an amount which shall not exceed \$1.35 per gross ton of such pig iron so delivered at Saginaw, Mich., or \$1.50 per gross ton of such pig iron so delivered at Muskegon, Mich.; and that, if such purchaser shall require that such pig iron be delivered from the plant of such member of the code at either of such places by barge or vessel which shall be provided by such purchaser and for his account, such member of the code may allow a reduction in the delivered price of such pig iron otherwise chargeable under Section 4 of Schedule E of the code in an amount (in addition to the amount of the reduction hereinbefore in this paragraph 2 provided for) which shall not exceed 50c. per gross ton of such pig iron so delivered at Saginaw, Mich., or \$1.15 per gross ton of such pig iron so delivered at Muskegon, Mich.

3. In any case in which any purchaser shall purchase from any member of the code pig iron in an amount of 400 gross tons or more and shall require that such pig iron be delivered by water or rail-and-water transportation in a lot or lots of 400 gross tons or more f.o.b. barge or vessel alongside the dock of such purchaser at Phillipsdale, R. I., Branford, Conn., Bridgeport, Conn., Yonkers, N. Y., Brooklyn, N. Y., Elizabethport, N. J., Roebling, N. J., Burlington, N. J., or Florence, N. J., such member of the code may allow a reduction in the delivered price of such pig iron otherwise chargeable under Section 4 of Schedule E of the code in an amount which shall not exceed 60c. per gross ton of such pig iron so delivered.

Deductions on Sales of Pipe

Commercial resolution No. 42 permits manufacturers of pipe and other tubular products to sell at a discount to competitors who do not manufacture a full line to enable the latter to fill orders from their customers. The allowance on such sales has been fixed at not more than 5 per cent of the pub-

lished base price plus the deduction made to jobbers. Pipe makers purchasing tubular products under these terms are prohibited from reselling the products so bought at less than code prices.

COMMERCIAL RESOLUTION No. 42

Effective Jan. 18, 1934

Preamble and Resolution Adopted by the Board of Directors Jan. 11, 1934, by the Affirmative Vote of Three-fourths of the Whole Board, with Regard to Deductions From the Base Prices of Pipe and Other Tubular Products.

WHEREAS the board of directors has been advised that prior to the effective date of the code it had been a practice of long standing among members of the industry engaged in the manufacture of pipe and other tubular products to sell pipe and other tubular products manufactured by them to other manufacturers of pipe and other tubular products for resale by such other manufacturers with pipe and other tubular products manufactured by such other manufacturers at prices less than the then current prices of such pipe and other tubular products on sale to other purchasers thereof; and

WHEREAS the board of directors has also been advised that many members of the code engaged in the manufacture of pipe and other tubular products do not manufacture a full line of pipe and other tubular products and prior to the effective date of the code such members relied on their ability to purchase pipe and other tubular products of sizes and kinds not manufactured by them from other manufacturers of pipe and other tubular products at prices less than the current prices for such products on sales to other purchasers thereof in order to enable such members to fill orders from their customers for pipe and other tubular products of all sizes and kinds; and

WHEREAS the board of directors is of opinion that it is in the interest of the members of the code which are engaged in the manufacture of pipe and other tubular products, of the industry and of the purchasers of pipe and other tubular products that the continuation of such practice among members of the code engaged in the manufacture thereof be permitted; and

WHEREAS the board hereby determines that it is in the interest of the iron and steel industry and of other branches of industry and that it will not tend to defeat the policy of Title I of the National Industrial Recovery Act to permit members of the code to allow deductions from the base prices of such members for products sold by them in the cases and to the extent hereinafter provided;

RESOLVED that, if any member of the code which shall produce pipe and/or other tubular products shall sell or contract to sell any of such pipe and/or other tubular products to another member of the code (hereinafter called the purchaser) which also produces pipe and/or other tubular products, for delivery at the plant of the purchaser and for resale by the purchaser only in connection with the sale of pipe and/or other tubular products produced by the purchaser, such member of the code may allow to the purchaser a deduction from the published base price of such member then in effect for the pipe and/or other tubular products so sold or contracted to be sold by it to the purchaser in an amount not exceeding 5 per cent (5%) of such base price plus the amount of any deduction from such base price which such member of the code may be permitted to make to any jobber of such pipe and/or other tubular products under Section 4 of Schedule E of the code and the regulations prescribed by the board of directors thereunder and then in effect; provided, however, that, before such member of the code shall allow to the purchaser

any such deduction from the published base price of such member then in effect for such pipe and/or other tubular products, such member shall secure from the purchaser an agreement in writing whereby the purchaser shall agree with such member (a) that the purchaser will not, without the approval of the board of directors, directly or indirectly through any concern in which or in the profits of which the purchaser directly or indirectly shall have a substantial interest, sell such pipe and/or other tubular products to any third party at a price or on terms and conditions more favorable to such third party than the price, terms and conditions at which any member of the code which shall then produce a product of the kind so sold might then sell such product to such third party in conformity with the provisions of the code, and (b) that, if the purchaser shall violate such agreement, the purchaser shall pay to the treasurer as an individual and not as treasurer of the institute, in trust, as and for liquidated damages the sum of \$10 per ton of such pipe and/or other tubular products sold by the purchaser in violation thereof.

Government Buying Changed

Commercial resolution No. 44 authorizes steel companies, in effect, to sell the Federal Government on an f.o.b. plant basis. Since the Government in many cases is able to make railroad shipments at less than published tariff freight rates, a sales arrangement whereby title passes at the steel company's plant permits the purchasing department or division to take delivery as it sees fit.

COMMERCIAL RESOLUTION No. 44

Preamble and Resolution Adopted by the Board of Directors Jan. 11, 1934, Interpreting and Construing the Provisions of Section 4 of Schedule E of the Code with Regard to the Allowance of Freight Charges on Products Sold to the Government of the United States of America or a Department or Division Thereof.

WHEREAS the board of directors has been advised that in many cases the Government of the United States of America is entitled to ship products which are the property of such Government over the lines of railroad companies at rates which are lower than the published tariff freight rates of such companies for shipments of such products over their lines; and

WHEREAS the board has been advised that some confusion has arisen among members of the code as to the amount of the allowance which a member of the code may make in respect of freight charges on the shipment of products sold by such member to the Government of the United States of America or to any department or division thereof and shipped over the lines of such railroad companies; and

WHEREAS the board deems it advisable, in order that unfair competitive conditions in the industry may not be created by reason of any uncertainty in respect of the amounts of such allowances which may be made by members of the code, that the board interpret and construe the provisions of the code in that regard;

RESOLVED that the board of directors hereby interprets and construes the provisions of Section 4 of Schedule E of the code as permitting any member of the code which shall sell or contract to sell any product to the Government of the United States of America or any department or division thereof at a delivered price determined as provided in said section for delivery at the place where such product is to be used by such Government or such department or division thereof to allow to such Government or to such department or division thereof the full published tariff freight charges on such product from the plant of such member of the code to such place, provided that such member of the

code shall thereby be relieved of the payment of all such freight charges, it being understood that such member of the code shall in connection with the sale or contract of sale of such product make arrangements with such Government or such

department or division thereof whereby the latter shall take title to such product at such plant, but that such arrangements shall not in any way affect the delivered price of such product determined as provided in said Section 4.

United States Shipbuilding Trails in World Procession

THE world's total tonnage of ship construction orders in hand shows little change from the position at the end of September last, says Lloyd's Register, the present figures recording a gain of only 525 gross tons.

Of the ten leading shipbuilding countries of the world, only Great Britain and Ireland, Japan and Spain report gains during the last quarter. Japan's tonnage in hand shows an increase of about twenty-five per cent, while Great Britain and Ireland, and Spain, each show an advance of approximately ten per cent. For the United States during the past quarter there was a decrease of about ten per cent. Italy showed the sharpest decline, her production falling off more than fifty per cent.

How the volume of tonnage in hand has compared in the last two quarters in Great Britain and Ireland, the United States, and the other maritime countries, taken as a group, is shown in the following table, the figures representing gross tons of merchant vessels being built:

| | Dec. 31, '33 | Sept. 30, '33 |
|---------------------------------|--------------|---------------|
| Great Britain and Ireland | 331,541 | 303,762 |
| United States | 12,373 | 14,654 |
| Other countries .. | 413,363 | 438,336 |
| World total | 757,277 | 756,752 |

At the end of 1932 the world was building 765,720 gross tons of merchant shipping, says Lloyd's statement, of which 29.5 per cent was being constructed in Great Britain and Ireland, 7.7 per cent in the United States, and the remaining 62.8 in the other countries, taken together. At the end of 1933, of the total of 757,277 gross tons in hand, 43.8 per cent was building in Great Britain and Ireland, 1.6 per cent in the United States and 54.6 per cent in other countries. At the end of 1932, Great Britain and Ireland were constructing 106,000 gross tons less than at present, while the United States was building 47,000 tons more than now, and the other countries 66,000 tons more than they are producing at this time.

The figures cover the construction of all merchant vessels of 100 gross tons and upwards, each, now being built throughout the world, except in Russia, and of these, 557,032 tons, are being built under the supervision of Lloyd's Register and are intended for classification with that society. This figure includes 319,322 tons building in Great Britain and Ireland, and

237,710 tons in the other maritime countries combined. Over ninety-six per cent of the construction in Great Britain and Ireland, therefore, is being supervised by Lloyd's, and nearly three-fourths of the entire world production.

During the past quarter more new tonnage construction was placed with the shipbuilders of Great Britain and Ireland than with all other countries combined.

A further decrease in the construction of tankers was shown during the quarter ended Dec. 31 last. For steam and motor vessels of this type, each of 1,000 gross tons and upwards, there was a decline of about 30,000 tons from the total at the end of Sept. last. Japan, however, doubled the total of its tonnage of this type under way. Sweden's total dropped 6500 tons, while the volume under way for Great Britain and Ireland and for Spain remained unchanged. For the other countries, however, there was a very sharp shrinkage, as shown by the following table of gross tonnage, covering the last two quarters:

| | Dec. 31, '33 | Sept. 30, '33 |
|---------------------------------|--------------|---------------|
| Sweden | 41,100 | 47,600 |
| Great Britain and Ireland | 31,026 | 31,026 |
| Japan | 19,200 | 9,600 |
| Spain | 18,212 | 18,212 |
| Other countries .. | 8,070 | 42,626 |
| World total | 117,608 | 149,064 |

By far the greater part of the tanker tonnage under way is composed of motor vessels, says Lloyd's, these representing 99,848 gross tons of the 117,608 tons total.

Fifty-five per cent of all types of merchant vessels now building are motor ships. During the quarter just ended the construction of vessels equipped with internal combustion engines showed some gain, in contrast with a loss in the previous quarter, and the volume of motor ship tonnage under way is greater than it was a year ago, while that of other types of vessels shows a decrease. Work in hand during the last two quarters is shown by Lloyd's in the following gross tonnage table:

| | Dec. 31, '33 | Sept. 30, '33 |
|--------------------|--------------|---------------|
| Motor vessels | 418,254 | 414,095 |
| Other types | 339,023 | 342,657 |
| Total | 757,277 | 756,752 |

For Great Britain and Ireland an increase of 25,000 gross tons in motor ship construction is shown during the quarter ended Dec. 31 last, while for the other countries combined there

PERSONALS

E. E. GOODWILLIE has been appointed assistant to the vice-president in charge of sales of the Bethlehem Steel Co., Bethlehem, Pa. He has been identified with the Bethlehem organization in many capacities, recently as special representative and for a number of years as manager of structural sales. Mr. Goodwillie was at one time district sales manager at Cleveland and was made Chicago district sales manager in September, 1922. J. V. HONEYCUTT has been made assistant general manager of sales. He has been in charge of frog and switch sales, having joined the Bethlehem organization many years ago, and has represented the company in the district sales offices at Atlanta, New York and other points.

V. GILMORE IDEN, director of public relations for the American Institute of Steel Construction, New York, has been appointed acting secretary. Mr. Iden is a Virginian by birth and education. For many years he was a Washington newspaper correspondent. From 1918 to 1921 he was identified with the Penton publications in New York, and later was managing editor of the New York Journal of Commerce during the days of the Dods-worth ownership.

FRED P. BIGGS, who has been identified since 1916 with the American Brake Shoe & Foundry Co., has been made assistant vice-president, with headquarters in Chicago. He entered the employ of the company as service engineer in New York and was transferred to the Chicago office in 1922.

WALTER H. GEBHART, since 1931 assistant manager of industrial sales of

Henry Disston & Sons, Inc., Philadelphia, has become manager of this division. He joined the Disston organization as a correspondent in the sales department in 1910 and was transferred to the production department. He returned later to the sales department as a products specialist in mill goods.

FREDERICK M. FEIKER, formerly director of the Bureau of Foreign and Domestic Commerce, has been elected executive secretary of the American Engineering Council, Washington, succeeding LAWRENCE W. WALLACE, who has resigned to become vice-president of the W. S. Lee Engineering Corp. Mr. Feiker was graduated from the Worcester Polytechnic Institute in 1904 and has spent the first half of his business life in editorial and publishing work. Beginning in 1920, he was successively assistant to the Secretary of Commerce, operating vice-president of the Society for Electrical Development, managing director of the Associated Business Papers, and director of the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

S. M. D. CLAPPER has been elected president of the General Refractories Co., Philadelphia, succeeding JOHN R. SPROUL, who has resigned. Mr. Clapper was chairman of the board, which post has been abolished. Mr. Sproul has been appointed assistant to the president.

W. E. MCILROY, heretofore in charge of field sales of Aluminum Industries, Inc., Cincinnati, has been made sales manager, and BRUCE V. KELLER, formerly district manager, has been

made advertising manager of the company. C. W. MCDANIEL, formerly director of sales and advertising, has resigned.

C. B. CROCKETT, former secretary of the Industrial Truck Association and more recently a partner in Crockett, Lightner & Smith, engineers, New York, has joined the Cleveland Tractor Co., Cleveland, as sales engineer.

J. GUY GRIFFITH has been appointed Pittsburgh district sales representative, with headquarters in the Nixon Building, for Ampco Metal, Inc., Milwaukee.

JOHN F. COLEMAN, consulting engineer, New Orleans, has been elected president of the American Engineering Council. Other officers representing the several national and local engineering societies were elected at the annual meeting in Washington, Jan. 11 to 13, as follows. For vice-presidents of the council, C. O. BICKELHAUPT, vice-president of the American Telephone & Telegraph Co., New York, representing the American Institute of Electrical Engineers; PAUL DOTY, consulting engineer, St. Paul, representing the American Society of Mechanical Engineers; A. J. HAMMOND, consulting engineer, Chicago, representing the American Society of Civil Engineers; W. H. WOODBURY, Duluth, representing the local engineering societies. C. E. STEPHENS, of the American Institute of Electrical Engineers, was elected treasurer and WILLIAM MCCLELLAN, president of the Potomac Electric Power Co. of Washington, was elected chairman of the finance committee.

HARRY W. HAGGERTY, formerly vice-president and general sales manager, Corrigan, McKinney Steel Co., Cleveland, has become associated with the

New Officers of Bethlehem Steel Co.



F. A. Shick, vice-president and comptroller.



J. M. Larkin, vice-president in charge of industrial and public relations.



C. R. Holton, vice-president in charge of purchases.



E. E. Goodwillie, assistant to vice-president in charge of sales.



J. V. Honeycutt, assistant general manager of sales.

Newman Iron & Steel Co., Cleveland, scrap iron dealer.

♦ ♦ ♦

HAROLD A. HALLSTEIN, for seven years general auditor of the Austin Co., Cleveland, engineer and builder, has been made a vice-president of the company. He joined the Austin organization in 1911 and has been identified with many phases of construction and engineering work since that time.

♦ ♦ ♦

CHARLES H. RHODES has been appointed assistant general manager of sales in charge of bars and alloy steel



C. H. RHODES

of the Illinois Steel Co., succeeding WILLIAM I. HOWLAND, JR. Mr. Rhodes, who was born in New Castle, Pa., entered the service of the American Steel & Wire Co. in 1899 and since that time has served with subsidiary companies of the United States Steel Corp., as purchasing agent of the American Steel & Wire Co., Canadian Steel Corp., Minnesota Steel Co., Universal Portland Cement Co. and the Illinois Steel Co.

♦ ♦ ♦

JOHN B. STRAUCH, president of the National Bearing Metals Corp., St. Louis, has been elected a member of the board of directors of the General American Life Insurance Co., St. Louis, it has been announced by Walter W. Head, president of the company.

Mr. Strauch has been connected with the National Bearing Metals Corp. more than 39 years, during which time it has grown to be recognized as one of the largest concerns of its type in the country. Mr. Strauch will assume his new duties immediately with the General American Life company.

♦ ♦ ♦

EDWARD N. HURLEY, JR., president, Hurley Machine Co., Chicago, has been reelected president of the American Washing Machine Manufacturers Association.

GEN. THOMAS S. HAMMOND, president, the Whiting Corporation, Harvey, Ill., has been elected chairman of the advisory committee of the Illinois Manufacturers' Association.

♦ ♦ ♦

F. P. HARRIGAN has been appointed sales representative in the New York metropolitan area for the Sheffield Machine & Tool Co., Dayton, Ohio, manufacturer of precision gages. His headquarters are at 30 Church Street, New York. HOMER B. JOHNSON has been named western divisional manager with offices at 549 West Washington Boulevard, Chicago. Mr. Johnson formerly was sales representative at Chicago for the Pratt & Whitney Co.

♦ ♦ ♦

A. D. SHANKLAND, who has been identified with the Bethlehem Steel Co. since 1914, has been promoted to engineer of tests, succeeding A. P. SPOONER, who has been transferred to other duties. S. D. GLADDING, superintendent of Lehigh Mills, has been appointed superintendent of No. 1 and 3 open hearths. A. C. CUSICK, general maintenance foreman of No. 1 and 3 open hearths and Lehigh Mills, has been promoted to the superintendency of Lehigh Mills. R. J. KNEER succeeds Mr. CUSICK as general maintenance foreman. J. C. FOSTER has been made assistant combustion engineer.

♦ ♦ ♦

ERNEST QUERY, for the past 20 years connected with Henry Disston & Sons, Inc., Philadelphia, has been made sales manager of the hardware department. He has been assistant manager of that department since 1926.

OBITUARY

EDWARD J. KEARNEY, secretary and treasurer, Kearney & Trecker Corp., Milwaukee, died Jan. 12 from pneumonia after having been in failing health for several months. He was 66 years of age. Mr. Kearney was born



E. J. KEARNEY

in Mitchell County, Iowa. He was left an orphan at 12 and began his career as an engine wiper in a railroad roundhouse at Egan, S. D., eventually attending Iowa State College at Ames, from which he was graduated in 1893. He then obtained employment in the car and locomotive shops of the Milwaukee Road at Milwaukee, later joining the Kempsmith Mfg. Co., as a draftsman. In 1898 he became associated with Theodore Trecker, a former fellow worker in the railroad shops at Milwaukee, as Kearney & Trecker, manufacturers of milling machines. The business was incorporated under its present name in 1906. Mr. Kearney was one of the original members of the Wisconsin State Board of Vocational Education. He was prominent in Milwaukee civic and industrial life for many years and a member of the American Society of Mechanical Engineers. Mr. Kearney was president of the American Machine Tool Builders Association in 1922-1923.

♦ ♦ ♦

JOHN HEIL, SR., works manager, the Heil Co., Milwaukee, and elder brother of Julius P. Heil, president and general manager, died Jan. 9, aged 62 years. He was born in Germany, coming to America in boyhood. He became associated with the Heil Co. shortly after it was established.

♦ ♦ ♦

JOSEPH W. WILKENS, secretary and treasurer, Claffey Casting Co., Waukesha, Wis., died Jan. 11, aged 55 years. He was born in Waukesha County and before joining the Claffey company a year ago was associated with the Waukesha Motor Co., of which he was one of the original stockholders.

♦ ♦ ♦

JOSEPH FRIEDL, for the past 20 years shop superintendent of the Avey Drilling Machine Co., Covington, Ky., died suddenly in his office on Jan. 11. Mr. Friedl was 57 years old and had been with the firm for 30 years.

♦ ♦ ♦

PETER J. GORDON, formerly general superintendent of the Republic Iron & Steel Co., died last week at his home at Beverly Hills, Cal. He was 75 years old. Mr. Gordon started his career in the steel industry at the Homestead, Pa., plant of the Carnegie Steel Co., subsequently going to the Belleaire plant of that company. He joined the Republic Iron & Steel Co. in 1900, when its Bessemer converters were installed, and became the first superintendent of the Bessemer plant. Later he was made general superintendent, in which capacity he remained until his retirement in 1930.

♦ ♦ ♦

THOMAS A. MCLOUGHLIN, for 25 years recording secretary of the sales committee of the General Electric Co., died at his home in Schenectady, Jan. 8, aged 70 years.

▲▲ LETTERS TO THE EDITOR ▲▲

Dollar Devaluation Only Temporary Export Aid

Editor, THE IRON AGE

IN his message to Congress on Jan. 3, the President said: "Furthermore, all of us are seeking the restoration of commerce in ways which will preclude the building up of large favorable trade balances by any one nation at the expense of trade debits on the part of other nations."

Those who have had the benefit of experience in foreign trade realize that there can be no appreciable betterment of the world's economic situation until the barriers now hampering trade are lowered. Whether this is taken as applying to the United States or to the smallest European country, it is a fact that no economist or politician can disprove. The free movement of goods in international trade is an inspirer of confidence and a steadying factor in all industries, regardless of their situation or importance. It is the artificial, changing barrier that confuses the business man and prevents long-distance planning, which is the governor of trade. Neither politicians nor economists, as a general rule, appreciate the importance to the manufacturer and merchant of a clear road ahead. Therefore, when the politician, through interference with the natural laws of supply and demand, beclouds the horizon, he simultaneously weakens the strength and initiative of the most important element of his community.

Since the war and, particularly, since the beginning of the depression, the increase of tariff barriers and the inauguration of the quota system have been general. The direct result is that world trade has dropped to about one-third of its 1929 level. Granted that this level was swollen out of normal proportions by the boom period, the loss is still great enough to have a serious influence on general trade in the various countries, and this influence has brought in its wake other influences, notably the fall in the tourist traffic that has had ruinous effects on certain countries to whom this traffic is a necessity.

Undoubtedly, during the boom period many goods not normally exportable in considerable quantities were exchanged by countries, due to the prevailing differences of exchange, wages, cost of living, etc., and in order primarily to exclude these goods, which were a menace to local industries, heavy tariff barriers on all goods were erected. But the time has now come when, in the interests of world recovery, the world's statesmen will be obliged to sit down together and to devise means of removing

many of the barriers so thoughtlessly erected. No policy of nationalism can close its eyes to the fact that, in the interests of all, restrictions must be raised and freedom must again be given to the men who distribute the products of other men's labor.

Each country possesses products that are essentially the specialties of its people. In many cases, such products are not made elsewhere, unless of an inferior style or quality. Under present conditions of trade restrictions, world consumers are prevented from buying the perfumes, silks, styles and china of France, the cloths and leather goods of England, the cheese, chocolate, embroideries and wood-carvings of Switzerland, the fancy goods of Austria and Czechoslovakia, the toys, cutlery, beer, porcelains and gingerbread of Germany, the machinery, tools and labor-saving appliances of the United States and the tobaccos of the Orient by excessive duties that do not help local industries, but merely place these articles beyond the reach of the consumer. Instead of permitting the individual to gratify his taste for the specialties of other lands, governments, under the guise of protecting him from himself, take it upon themselves to dictate how he shall or shall not spend his earnings. It is time that this narrow, mistaken policy be relegated to the dark ages from which it came and that the freedom of thought and speech for which we stand in this century be translated into a certain amount of freedom of action and choice.

Other nations cannot buy from us unless we buy from them. We cannot buy from others unless they buy from us. The hotelkeeper in Switzerland cannot buy an American automobile, an American typewriter, an American radio or an American refrigerator unless we purchase an equivalent amount of Swiss products, or unless our tourists vacation in his country. If the balance of trade is greatly in our favor the Swiss Government is forced to erect prohibitive tariff barriers or to resort to quotas to protect its gold reserve. This is exactly what has happened to our growing Swiss market.

In France, until very recently, we have seen the quotas allotted to American products steadily decrease and the tariff barriers rise. It is a direct result of our decreasing purchases of French products. And yet we see in the United States a great potential market for French products that do not seriously compete with our own manufactures, and we know that there is a great potential market in France for a number of our products that in workmanship, efficiency and design have outdistanced the world.

The devaluation of our dollar is an

added burden that our business must carry. While its first effects are to increase our exports, it inevitably tends to decrease our imports and thus acts as a further incentive to foreign countries to erect still higher barriers against us. It is not a friendly manner to encourage trade.

There is scarcely a country in the world that would not welcome an opportunity to discuss with us lower tariff rates. And such a discussion would inevitably lead to mutual exchanges that could only have the effect of brightening the horizon for our manufacturers and merchants and of hastening the recovery we desire.

CHARLES E. CARPENTER.

World Needs Less Drums But More Drummers

Editor, THE IRON AGE

FOR fifteen years, politicians have governed the trade of the world. When the Allied politicians at Versailles set their seals to the historic document, the Covenant of the League of Nations, they brought into being the most efficient weapon for killing trade that the cupidity of men could devise. For thenceforth, trade was not to govern relations between peoples, but trade was to be subservient to what are now known as national policies. Politics, not business, became the guiding force in human relations.

The stage at Geneva became the scene of new efforts of the politicians to add lustre to their names. Well might the world go hungry if only the public press might resound with the eloquence of statesmen explaining the new order of things, crying undying allegiance to the new order of human brotherhood and jockeying for preferred positions in the business of telling other people how they should order their lives and in determining their rights and privileges. Hundreds of millions of people have sat patiently, waiting for the politicians to draw new and more beautiful rabbits from their fashionably-cut sleeves and coat-tails. Governments and statesmen have fallen like ninepins while oratory hummed and bright definitions of national aims and needs were brought out and flashed before a hypnotized public.

The strangest thing of all is that the public really expected something to come out of the whirligig at Geneva. The public expected decisions that would affect its business, but affect it favorably and not the reverse. The public expected a little bit of disarmament and some trade understandings and friction removers and the settlement of debts and reparations and a plan for keeping the world's peace, at least for a little while. What it has got has been a

snarl out of which a good part of the world has even got visions of war.

War Is Not Good for Trade

Now, war is not good for trade. Someone said recently that four times as many men are employed in times of peace as in times of war. Hence, from a business standpoint, peace is four times as good as war, and statesmen should be busily engaged in sowing the seeds of peace, instead of scraping the skin to produce the sores of war. But statesmen as a rule are not business men and they do not know how to satisfy a customer. They think it is their business to argue with customers, than which there is no surer way to bankruptcy.

The customers of the League having now fallen away, due to the fact that some of them are becoming interested in their own affairs rather than in the affairs of others, some of the more astute politicians desire to change the rules in order to attract more members. It is hard for politicians to give up the limelight, once they have enjoyed it. And the limelight of a world tribune, with five or six hundred newspaper scribes waiting with poised pencils to take down the drippings from oily tongues, is a serious thing to resist. Besides, the luxurious limousines with the tiny flags of the nations at the masthead, waiting at the stage entrance, give a sense of importance to even the most blase politician. It is refreshing, after the applause, to sink back in luxurious cushions and to order the chauffeur to drive some place where the cooking is very good.

The question is: Now that world statesmen have tried out all their tricks and have shown that the rabbit is always the same, with only a different ribbon around its neck, who is to sweep out the place and make it ready for business? The logical one to do it is the one who started the thing. And as the United States had the brilliant idea to make all men brothers (only it forgot the politicians), it would seem as if the United States ought to be the one to show the way out of the maze.

Jobs Make Business

The world having now finally come to the inescapable conclusion that jobs make business and business makes prosperity could very well use its new-found knowledge to persuade other nations of this golden truth. It is very easy, after we have made a mistake, to look sour and to try to find somebody to blame it on. But while we are hunting for a scapegoat our business can very easily dry up. And this is what has happened to international trade. While statesmen have been explaining to the world why their country was different from anybody else's country and, therefore, needed more protection or more bayonets or more barriers, business that

pays the taxes and incidentally their travelling expenses and salaries has dried up to a point where the job of the politician is about the only sure thing.

We could very well use this virgin new year that has not yet been spoiled by any international political schemes to get around a little and to interview some of the countries about letting down the bars to trade. A traveling Ambassador, with a line of samples of United States goods and enough authority to whittle away some barriers in exchange for like favors on the part of the U. S. would do a great deal more good than one whose bag-

gage was filled with guns and gas containers. We are too simple a people from the standpoint of international political guile to cut much of a figure in determining the exact difference between principle and practice, but we know how to make good carpet sweepers and electric egg-beaters, and there will always be carpets to be swept and eggs to be beaten.

Our Secretary of State has some very good ideas about exchanging egg-beaters for Egyptian cigarettes, and it is to be hoped the professors and the economists will let him do his stuff.

A SUBSCRIBER.

Mayville Furnaces Razed

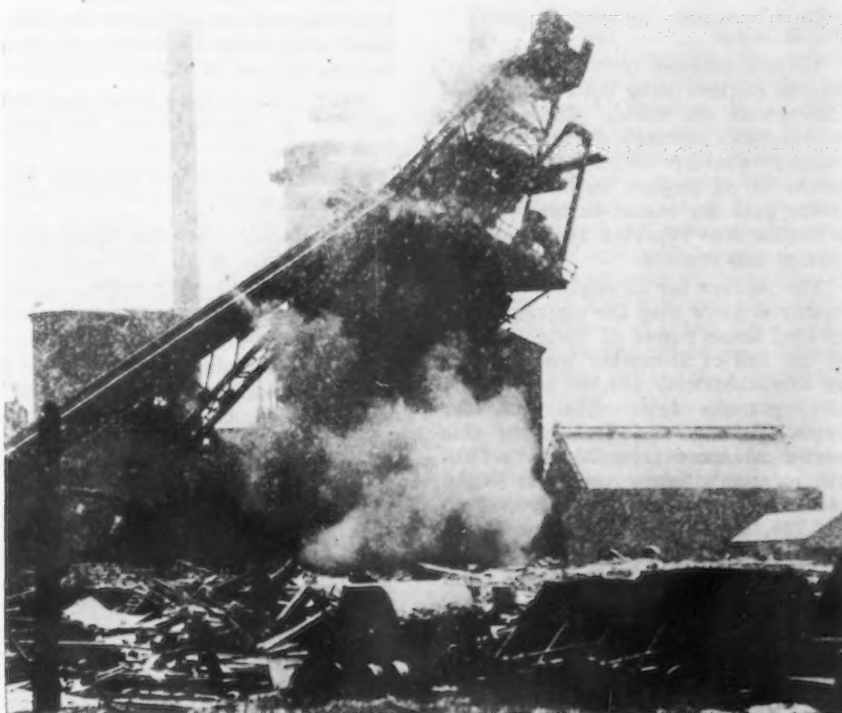
THE two blast furnaces of the Mayville Iron Co., Mayville, Wis., former subsidiary of the Youngstown Sheet & Tube Co., have been razed by Iron & Steel Products, Inc., Chicago. The State of Wisconsin, at one time an important producer of pig iron, can now boast of only two standing stacks, both located at Milwaukee and both indicated as abandoned in 1928. About 10 years ago the charcoal furnace at Ashland, Wis., was abandoned and within recent years the Thomas furnace at Milwaukee was dismantled. The result is that Wisconsin is now producing no pig iron after having pioneered in the industry in the Middle West.

The Mayville furnaces were originally built in 1848 and were last re-

built in 1922. Their annual capacity, when last operated, was 275,000 tons of foundry and high phosphorus pig iron.

The job of dismantling the furnaces was interesting, because it was desirable to drop the stacks without damage to the blowing house which stood near by. The method adopted was to tie a cable to the top of a stack and stretch it away from the blowing house. Several charges of dynamite were then exploded at the base, toppling the stack away from the adjacent building.

Examination of the stacks after they had been blasted down revealed that no brick had been dislodged from the linings.



This stack started to fall within a few seconds after a blizzard started.

was a decline of about 20,000 tons in this type of building. As a result, 33 per cent of all tonnage now building in Great Britain and Ireland is to be motorized, as compared with 28 per cent at the end of September, and only nine per cent a year ago. For the other countries, taken as a group, the proportion of motor vessels to other tonnage remains at 72 per cent, as in September; and compares with 69 per cent at the end of 1932. Comparison of the production of the various classes of ships during the quarter ending Dec. 31 last, is shown by Lloyd's in the following table, the figures representing gross tons:

| | Great Britain and Ireland | Other Countries |
|--------------------|---------------------------|-----------------|
| Motor vessels | 112,276 | 305,978 |
| Other types | 219,265 | 119,758 |
| Total | 331,541 | 425,736 |

While Great Britain and Ireland are producing the greatest volume of motor tonnage of any country, Japan made a marked advance during the last quarter, and is now nearing the 100,000 ton mark. These, however, with Spain, were the only countries to show gains in motor vessel construction during the quarter just ended, Italy reporting the greatest decline in the proportion of motorized tonnage under way. The following table shows the relative volume of motorship building in the various countries during the last two quarters, in gross tonnage:

| | Dec. 31, '33 | Sept. 30, '33 |
|---------------------------------|--------------|---------------|
| Great Britain and Ireland | 112,276 | 87,294 |
| Japan | 95,660 | 77,470 |
| Sweden | 63,100 | 69,900 |
| Holland | 40,105 | 40,427 |
| Spain | 28,952 | 28,052 |
| Denmark | 21,997 | 26,150 |
| Germany | 21,510 | 28,500 |
| France | 14,576 | 19,758 |
| Italy | 11,200 | 27,076 |
| United States | 503 | 653 |

Lloyd's returns cover all types of marine engines being built or installed throughout the world. There was a considerable advance during the December quarter in the aggregate power of oil engines in hand, and a lesser gain for steam turbines, while a decline was reported for steam reciprocating engines.

The returns for oil engines from all countries show that the aggregate indicated horse power of those in hand at the end of December was 621,216, as compared with 494,192 at the end of September last. The total for Great Britain and Ireland in this period advanced from 72,939 to 108,101. Japan's figure rose from 83,990 to 123,510; Holland's from 96,885 to 119,725, and Germany's from 70,072 to 80,465. Sweden showed a gain from 55,470 to 61,045; Denmark, from 27,350 to 34,200, and the United States from 5,726 to 7,210.

For steam turbines, the total shaft horse power, for all countries, advanced from 423,073 to 466,082. Practically all the gain was accounted for by Great Britain and Ireland, whose

figure rose from 229,470 to 257,755; the aggregate for France and for the United States remaining at 172,000 s.h.p. and 6300 s.h.p., respectively.

The total indicated horse power of reciprocating engines in hand in all countries showed a decline during the last quarter, going from 98,883 I.h.p. to 85,873 I.h.p. For Great Britain and Ireland there was a decrease, from 74,698 to 72,623.

While Great Britain and Ireland continue to lead all shipbuilding countries in the production of tonnage, Japan, during the quarter ended Dec. 31 last, Lloyd's figures show, displaced France as the runner-up, the latter taking third place, which was held by Japan during the September quarter. There were not many changes in the ranking of the other countries. Sweden and Holland remained in fourth and fifth positions, respectively. Spain, however, which had been seventh in the September quarter, and Denmark, which had been sixth, exchanged places in the

last quarter. Germany retained eighth place; but, owing to the marked decrease in Italy's output, the United States moved from tenth to ninth position, leaving Italy in last place.

Comparisons of the tonnage under way during the last two quarters are given by Lloyd's in the following gross tonnage table:

| | Dec. 31, '33 | Sept. 30, '33 |
|---------------------------------|--------------|---------------|
| Great Britain and Ireland | 331,541 | 303,762 |
| Japan | 106,760 | 85,570 |
| France | 90,656 | 95,838 |
| Sweden | 64,640 | 71,440 |
| Holland | 40,540 | 40,862 |
| Spain | 35,724 | 31,924 |
| Denmark | 24,663 | 31,970 |
| Germany | 22,510 | 30,300 |
| United States ... | 12,373 | 14,654 |
| Italy | 11,200 | 27,076 |

No increase is reported in the construction of large vessels, of the 20,000 gross tons and upwards class. Only two of these are underway and, as in the September quarter, they are being built, one by Great Britain and Ireland, and the other by France.

Steel Prices Attacked At NRA Consumer Hearing

WASHINGTON, Jan. 16.—Hearings last week on price increases under NRA codes developed complaints against the iron and steel industry which fall into five classifications as follows:

That the rigid basing point pricing system for pig iron favors foundries in the metropolitan areas. To a lesser degree complaints of like character were made by melters of steel-making grades of iron.

That Youngstown, Ohio, has been omitted as basing point for plates and sheets.

That uniform prices for steel have been established.

That Pacific coast warehouse prices will eliminate small users of structural shapes in that area.

That increased quality and quantity extras have been excessive.

These complaints were presented by the Consumers' Advisory Board in a single-spaced, 32-page mimeographed brief. Few and scattered complaints against the steel code came also from State and municipal purchasing agents. The hearings were in charge of Division Administrator A. D. Whiteside. In a report on the price hearings, Mr. Whiteside informed National Recovery Administrator Hugh S. Johnson that it appears evident that it will be necessary to hold hearings to investigate specific implications involved in regard to price provisions in some codes. It is expected that further hearings will be held in

February, at which industries will be given opportunity to reply to complaints. In many instances some answers to complaints are made in the briefs, including the one on steel.

\$77,000,000 Loan to Pennsylvania Approved

The Interstate Commerce Commission today approved a loan of \$77,000,000 by the PWA to the Pennsylvania Railroad. The money will be used to complete electrification between Wilmington, Del., and Washington and to purchase 7000 freight cars. Approximately \$45,000,000 will be used to complete electrification. The purchase of 101 electric passenger, freight and switching locomotives will cost an additional \$15,000,000. Purchase of the freight cars will mean an outlay of \$17,000,000. The cars will consist of 500 box cars with automobile loaders, 3000 box cars without automobile loaders, 1500 flat cars and 2000 40 ft. 6 in. box cars.

A Dutch metal-working publication, to appear fortnightly, is announced from Flushing, The Netherlands. It will be known as *Metaalbewerking* and from the indications of the preliminary issue will be made up largely of translations from the metal-working publications of other countries.



THIS WEEK IN WASHINGTON

Recovery Administration Is Considering Shorter Work Week

But Industry's Ability To Shoulder Higher Labor Cost Is Seriously Questioned

WASHINGTON, Jan. 16.—Hearings on the effect of codes on prices, held last week by the NRA, is the first of what has been called a "mopping up process" looking to a leveling out and correlation of activities under the NRA.

Further hearings are to be held. The next move is in the direction of reducing working hours. The plan, announced last week by National Recovery Administrator Hugh S. Johnson, has been anticipated for some time. General Johnson has from the beginning of the NRA said that hours would have to be reduced. He has repeatedly said that the 40-hr. week is too long if unemployment is to be absorbed. On the other hand he has said that the 30-hr. week would bankrupt industry. Thus the General appears to be striking a middle course between the 40-hr. week and the demands of organized labor for the 30-hr. week. What in-between point may be arrived at, and how industry may be able to bear further restrictions of hours, remains to be seen. This point has become especially vital inasmuch as there is a movement on foot to increase wages while reducing hours of work.

The issue will be discussed in detail at a meeting, perhaps to begin Feb. 15, which by some is interpreted as an attempt to head off efforts in Congress to establish the 30-hr. week. The meeting will be unique for it will consist of code authorities of all industries now operating under codes. Iron and steel, metal-working machinery, textile, coal, peanut, and all the industries will gather and talk

By L. W. MOFFETT
Resident Washington Editor
THE IRON AGE

over the plan to reduce hours of work. Coordination of the "code structure" is the way the plan is described. Competition between industries will be gone over in an effort to see if it can be smoothed out. A committee on energy already has been set up with a view to correlating various fuel and power industries. That is part of the general movement.

Automobile Industry an Exception

The fact that General Johnson last week boosted the hours of work in the automobile manufacturing code from 35 to 40 a week was held not to be inconsistent with the plan to reduce hours under 40 per week. The automobile code carried a reservation which provided that if conditions warranted, the hours could be increased. Moreover, it was the intention to keep employment more steady and to prevent an influx of unemployed into automobile producing areas at peak seasons with the result that many would be unable to find work and would become dependent on the affected communities. By maintaining the present force, or perhaps slightly increased forces at peak seasons, with longer hours, it is hoped to avoid this situation.

The meeting of code authorities, however, may result in again reducing the hours of work in the automobile as in other industries. Steel has a

40-hr. week and obviously would be affected greatly by the change. There are many who doubt the industry's ability to shoulder heavier labor costs. There also has been the contention that engaged labor itself may object, seeing that with shorter hours and the same hourly rate of pay its income will be cut, though purchasing power, it is argued, will be spread out because of the resulting additional employment.

Johnson Foresees Shorter Week

"I think that eventually this whole country has got to go to the shorter week," General Johnson said. "We have exhausted the possibilities statistically—on the codes of various industries—and it is a very tight question. There are a lot of these companies which have exhausted capital and reserves and can't borrow money. You have to consider the condition of industry or you will get kick backs and all that sort of thing. That would practically nullify all of your efforts. It is distinctly not a simple question."

The General said he did not know how long the work week would be and while he realized the movement toward the 30-hr. week, he pointed out that it cannot be established "by fiat decree without raising Cain."

It was suggested to General Johnson that one-half day might be knocked off coming down to 36-hr.

However, the General pointed out that it is necessary to have multiples of eight because the whole industrial organization is set up for that.

"That means 32-hr.?" he was asked.

"I don't mean to say there is any such plan," the General replied, "but we are discussing this thing in an academic way."

He pointed out that if it is a 5-day of 8 hr. each, making 40 hr. per week, as exists in steel and many other industries, it is a serious question as to whether it is possible to knock off anything less than 8 hr. in the week without disrupting crews, etc.

"You are thinking of continuous process industries?" he was asked.

"And, of course, most of the employing industries are continuous processes," the General said.

President Studying Problem

The White House is studying the proposed shorter week and the President is said to have held conferences with proponents both in and out of Congress of the 6-hr., 5-day week. Also he is understood to have considered the question with those who, while favoring a shorter work week, are opposed to a drastic drop to 30 hr. The President is said to share the latter view. Assurance has been given by some Congressional labor leaders not to press for 30-hr. legislation at this session and it is clearly the plan of the administration to bring about a general downward revision from the 40-hr. week through modification of codes themselves and therefore without legislation.

Senator Wagner, chairman of the National Labor Board, said that a reduction to 32 hr. by the NRA would prevent any legislation at the present session. The Senator is more nearly the spokesman for the White House than any other member of Congress. This statement excepts his attitude on the St. Lawrence waterway treaty over which he has sharply disagreed with the President.

Praising the stand of General Johnson as being a step in the right direction, Senator Wagner declared that if a 32-hr. week is brought about he thinks it will satisfy Congress. He added that 30 hr. automatically would follow soon. Chairman Connery of the House Committee on labor, affects a firmer attitude and said he did not think "we could accept any compromise," though he welcomed a reduction of hours through the NRA. It will mean, however, he declared, that "we will fight even harder for 30 hr. as a maximum with a provision of five days and 6 hr. per day."

Connery Will Fight For 30 Hours

Mr. Connery's attitude is merely like that he took at the previous session of Congress and resulted in easy defeat of his proposed 30-hr. bill. Nevertheless, the strong sentiment in Congress as well as in administrative circles for a sharp and quick downward slash of the work-week is a big and

imminent problem for industry. It has to be faced at once. There are many in industry who while certainly not thinking 40-hr. per week is excessive from a physical point of view would not object to some sort of a moderate reduction but doubt the financial ability of industry to carry the load.

For if capital, reserves and credit no longer are available so that industry can not go along on sharply cut work-week, labor obviously will suffer. It is probably true that prominent organized labor leaders fully realize this point and that where they are sponsoring the 30-hr. week they apparently are doing so only in a lukewarm fashion. The chief purpose perhaps is to strike a compromise and that appears to be the program urged by General Johnson. For his efforts General Johnson is being attacked both by the more radical elements of labor and the more inflexible industrialist.

The entire labor situation from the point of the American Federation of Labor will be aired with a big blast when its leaders assemble here on Jan. 24 to hear President William Green make a report on the NRA. It is a foregone conclusion that those who have not "gone along" with organized labor will be taken to the stake and burned alive. Particularly those who have challenged the jurisdiction of the National Labor Board will be the object of organized labor's wrath. Thus the steel industry promises to come in for the usual verbal castigation common to such meetings.

AFL to Demand Administrative Recognition

The indications are that organized labor will resume its demand for greater recognition by the NRA, especially in the way of more Deputy Administrators who either belong to organized labor or adhere strictly to its views. It is probable, too, that organized labor will again ask for representation on code authorities. Organized labor has been befuddled on this point. Some of its representatives opposed the idea at first. President Green was one of them. Then this group embraced and urged the plan. Other leaders are holdouts against the plan. General Johnson has turned his thumbs down on the plan for the present at least and has suggested to organized labor that it settle its own differences on the point before he proceed further.

Meanwhile the NRA has shifted on its labor policy. This is seen in the action of the National Labor Board in handing over to the National Compliance Board, of which William H. Davis is the director, the case of the E. G. Budd Mfg. Co., automobile body builder of Philadelphia. In announcing transfer of the case to the Com-

pliance Board, Chairman Wagner of the National Labor Board said he has been informed Director Davis is taking immediate steps for a hearing. The case grew out of a strike which began on Nov. 14 and was immediately brought before the Philadelphia Regional Board, which rendered a decision on Nov. 23. The case went to the National Labor Board and was heard by it on Dec. 7. It rendered a decision Dec. 14. Differences arose between the Budd Mfg. Co. and the National Labor Board over conduct of an election under the supervision of the Board, and moreover it was insisted by the company that its election of Sept. 1 had resulted in selection of representatives of the company labor union.

The Budd and Weirton Cases

The case parallels largely that of the Weirton Steel Co. The distinction made by the National Labor Board is that the Weirton Steel Co. made an agreement with the Board to conduct an election under the supervision of the Board while the Budd Mfg. Co. had not entered into such an agreement. President E. T. Weir later charged that the Board had altered its agreement and proceeded with an election called by the company. This case is still before the Department of Justice and is the subject of conferences between NRA and Department of Justice officials. It is held still to be a National Labor Board case. While both cases turn upon Section 7-a of the Recovery Act—the collective bargaining section—in the Budd case the plan now is to charge violation of the automobile code, while in the Weirton case there has been no charge of violation of the steel code but rather refusal to hold an election under the supervision of the Board under the terms of the agreement to which the company objects as having been changed from its original form. The Labor Board handles cases in an effort to settle labor disputes. Thus it retains with the Department of Justice the Weirton case. The National Compliance Board handles complaints against violation of codes and as such has been given charge of the Budd case.

Despite this distinction there are many who think the change was made because it is seriously doubted that the National Labor Board has the power it assumes. In any event the cases promise to set important precedents. While pending the Supreme Court of the United States has upheld the Government in its first historic decision in connection with the Recovery program, which dealt with the Minnesota mortgage moratorium case. This decision is held to strongly support the constitutionality of the entire program, including the labor section of the Recovery Act. However, it has been pointed out that each case will have to rest upon its own

merits and be decided accordingly and that no two are entirely analogous.

The Weirton Steel Co. case was the subject of a White House conference last Friday after which it was decided it would be brought to an early conclusion. It was stated it would be made a test of the labor provision (Section 7-A) of the Recovery act, the first of the kind. There are unverified reports that, if it is found that the National Labor Board does not have the authority to enforce an election at the company's steel plants for the purposes of selecting representatives for collective bargaining under the Board's supervision it might be decided to turn the case over to the National Compliance Board as has been done in the Budd case. In such an instance the assumption is that the Weirton company would be charged with violation of the steel code.

Those participating in the White House Conference with President Roosevelt were Secretary of Labor Frances Perkins, Attorney General Homer S. Cummings, National Recovery Administrator Hugh S. Johnson and Senator Wagner.

Hearing on Code Of Manganese Producers

WASHINGTON, Jan. 16.—Hearing on the code filed by the American Manganese Producers' Association will be held on Jan. 26 in the Raleigh Hotel before Deputy Administrator Walter A. Janssen.

Southern Pacific Wants \$12,000,000 Loan

WASHINGTON, Jan. 16.—Application has been made to the Interstate Commerce Commission by the Southern Pacific Railroad for authority to borrow \$12,970,735 from the Public Works Administration to be used for the purchase of 40,000 tons of rails and the necessary track fastenings and for repair work. It is estimated that the rails and fastenings will cost \$2,662,945, while material for repairs to locomotives will cost \$1,309,000. Material for repairs to freight equipment will cost \$842,300 and repairs to passenger equipment will cost \$624,250. Material for repairing bridges, trestles and culverts will cost \$803,920. The PWA has already made the allotment.

The Commission has approved the application of the Kansas, Oklahoma & Gulf Railroad to borrow \$290,834 from the PWA to purchase 5184 tons of 110-lb. rails and the necessary fastenings.

NRA Concerned About Code Price Structures

WASHINGTON, Jan. 16.—Price structures under codes are worrying the NRA.

Apprehension of this kind has been gradually growing. It is reaching a point where it is almost openly expressed. Failure to control either excessive or destructive prices, it is realized, would endanger the entire NRA program and all of its broad implications.

Most strikingly indicative of this trend is the hastily summoned meeting here today of the National Bituminous Coal Industrial Board, the first of the kind held. It was called by National Recovery Administrator Hugh S. Johnson. The announced purpose is "to consider and to make recommendations . . . as to any amendments to the Code of Fair Competition . . . or other measures which may stabilize and improve the condition of the bituminous coal industry and promote the public interest therein." It was further stated that the board will consider not only problems of code compliance and enforcement but also proposed modification of the present method of price control and possible amendment to centralize authority to administer the code.

The call of the coal conference came after repeated reports of price chiseling. Unavailing attempts have been made between Divisional and Sub-divisional code authorities in the industry to smooth out price relationships. Moreover, even within divisions price cutting is reported to be spreading. To stem this practice is one purpose of the meeting. Efforts will be made to establish prices and their relationships and to maintain them firmly. Reference to "proposed modification of the present method of price control and possible amendment to centralize authority to administer the code" is significant. It is in line with a known plan to set up in Washington central code authority for the industry with veto power in the hands of Government representatives to set up prices and practices for the entire country. Such a policy made applicable to the coal industry might well portend like action to other if not to all industries. Efforts have been made to draw a distinction between a raw resource industry like coal with its excess capacity over demand and manufacturing units. There is a school of thought which maintains that it is a distinction without a difference where capacity exceeds is greater than demand. In both instances it is maintained that the law of supply and demand sooner or later will project itself and govern the situation.

In this connection attention is being given to a statement made by Divisional Administrator A. D. Whiteside in his report to General Johnson on the price increase hearing. Little publicized at the time the consideration to the price structure has directed more thought to the following comment made by Mr. Whiteside in referring to price fixing.

It follows:

"Our past experience has demonstrated that it is almost impossible, even if it were contemplated, for groups of producers or distributors in which the number of units engaged is more than very few to maintain prices at fixed levels for a protracted period, for in all divisions of industry there are excess production facilities, and in the circumstances price agreements if made will inevitably be broken.

"When excess supplies hang over the market, prices cannot rise and remain at high levels.

"We look to the Code Authorities to keep in continuous contact with the trend of prices in each particular industry and voluntarily to suggest the necessary modification to prevent destructive price cutting or excessively high prices which will exploit the public or the small industrial or distributing buyer but we should not rely on this. The Administrator and the Consumers' Advisory Board will bring constant pressure to bear to bring about a just and fair result."

Coal Demand Feels High Price Effect

The coal conference was called to bring about this "just and fair result" and specifically one purpose is to prevent a collapse of prices. What its success may be is a matter of much concern to the entire NRA program and not only to the coal but to industries generally. Yet the program of maintaining prices, regardless of how fair they may be, is seen to be a difficult one in the coal or any other industry having a capacity that greatly exceeds requirements. Mr. Whiteside's paragraph seems to imply as much. The possible answer may lie in the central authority which may be set up in Washington with the Government through its representatives having the power to say yes or no. There is even consideration being given to the idea of correlating the relationship of prices between competitive industries, such as coal, petroleum, gas and hydroelectric power.

This "mopping-up" process of the NRA spreads to many possible angles. It is evident that some of them will be considered in connection

with the detailed analysis of the price hearings which Mr. Whiteside will make. Others are understood to be under consideration independently of this study.

The NRA finds itself facing conflicts of policy. It wants to bar chiseling. It wants to bar excessive prices. It apparently does not want the competitive system to disappear.

Increasing complaints are coming from smaller buyers at high prices. Likewise increasing complaints are being made about chiseling. Likewise public purchasing bodies, including the federal, state and municipal units, particularly the latter two, complain that they are no longer able to get competitive bids. They protest that identical prices are submitted. The Federal Government agencies are much less vocal about the matter. This is natural since the federal government itself is responsible for the NRA. Some of the state and municipal purchasing bodies want exemption from the price increases on the ground that they are large-scale buyers. Fear is felt that such a policy, if conceded, would encourage private large-scale purchasers to ask for similar concessions. That such a concession will be granted is altogether improbable.

Awards Made by Lottery System

Many who complain of identical prices point to instances which they say support their contention that the competitive system has been pushed aside. One reference is to purchases by Federal agencies, such as the navy, where bids are submitted and awards made by drawing lots from a hat. This applies to many lines.

These matters will undoubtedly be considered at the meeting here next month of code authorities for all industries. The upshot may mean a fundamental revision of the NRA policy and conceivably may mean the setting up of central authorities for the different industries to regulate policies, always with veto power lying with the Federal Government.

Many points as to price policies were discussed by Mr. Whiteside in his report to General Johnson.

He pointed out that naturally the hearing brought out the extreme and the exceptions in regard to the price changes which have occurred since the National Recovery Act was approved by the President. He said price changes reported on commodities, semi-manufactured products and consumable articles centered principally upon 28 codes of the total of 197 codes approved and that relatively few products of the tens of thousands of commodities and articles under codes were mentioned in the complaints.

Discussing the action of prices under the NRA, Mr. Whiteside said:

"The action of prices, including the general effect of code provisions

which in the majority of cases have increased the labor costs by a reduction in man hours and by an increase in minimum wages which automatically have increased the wages of those working in the higher occupational brackets; was also shown to be due to specific provisions originally designed to yield to particular industries or divisions of industry only a fair price for the products sold or the services rendered.

"Those specific provisions mentioned were—

"1. Not selling below cost, which has been defined in codes in several ways.

"2. By decreasing the discount in the selling terms to a uniform maximum figure lower than the prevailing average discount customarily granted by the various units within the industry or trade. The elimination of quantity or special trade discounts.

"3. Open price provisions.

"In addition to these facts prices in some cases appear to have been increased by group agreements on uniform surcharges to be added, which ostensibly are intended to absorb the added costs of process taxes and the increases in labor costs.

"Prices were reported to be further affected by other miscellaneous provisions or by actions on the part of groups due to misunderstandings of the code provisions or to actions taken not provided for under the codes."

Attention was called to the fact that in judging the relative mark-ups between industries it should be appreciated that the goods produced in the industries first affected by codes showed mark-ups in primary manufacturing, secondary manufacturing, wholesaling and retailing as costs were materially increased in each of these four steps.

Matters Challenge Attention

"The mark-up of goods to the consumer in various lines is affected in the difference between the distress price and a fair price in four different processes, which in one industry has more than doubled the consumer price, yet none or at least only a moderate profit has been earned in each step of the processing and distribution. In other cases, however, there are matters challenging attention which will be promptly given."

Mr. Whiteside said that "at the moment" it appears evident it will be necessary to hold hearings to investigate the specific implications involved in regard to price provisions in some codes. He informed General Johnson that the evidence will be studied in detail by the Research and Planning and other divisions during the next 10 days—the report was made Jan. 12—when a complete report regarding the complaints made will be submitted to Administrator Johnson. It was stated that code authorities will be notified regarding the evidence and given a chance to respond to complaints before further

action by the Administration. The report on the evidence will be made public, Mr. Whiteside said.

Committees to Study Small Airplane Output

WASHINGTON, Jan. 9.—The appointment of three subcommittees to proceed immediately into the various phases of the development of a volume-production airplane for private flying was the outgrowth of a meeting at the Department of Commerce last Thursday of a special committee of outstanding leaders in American aeronautics to study plans for the development of such an airplane. The Public Works Administration recently announced the allotment of \$500,000 to the aeronautics branch of the Department of Commerce for development work on a volume-production plane.

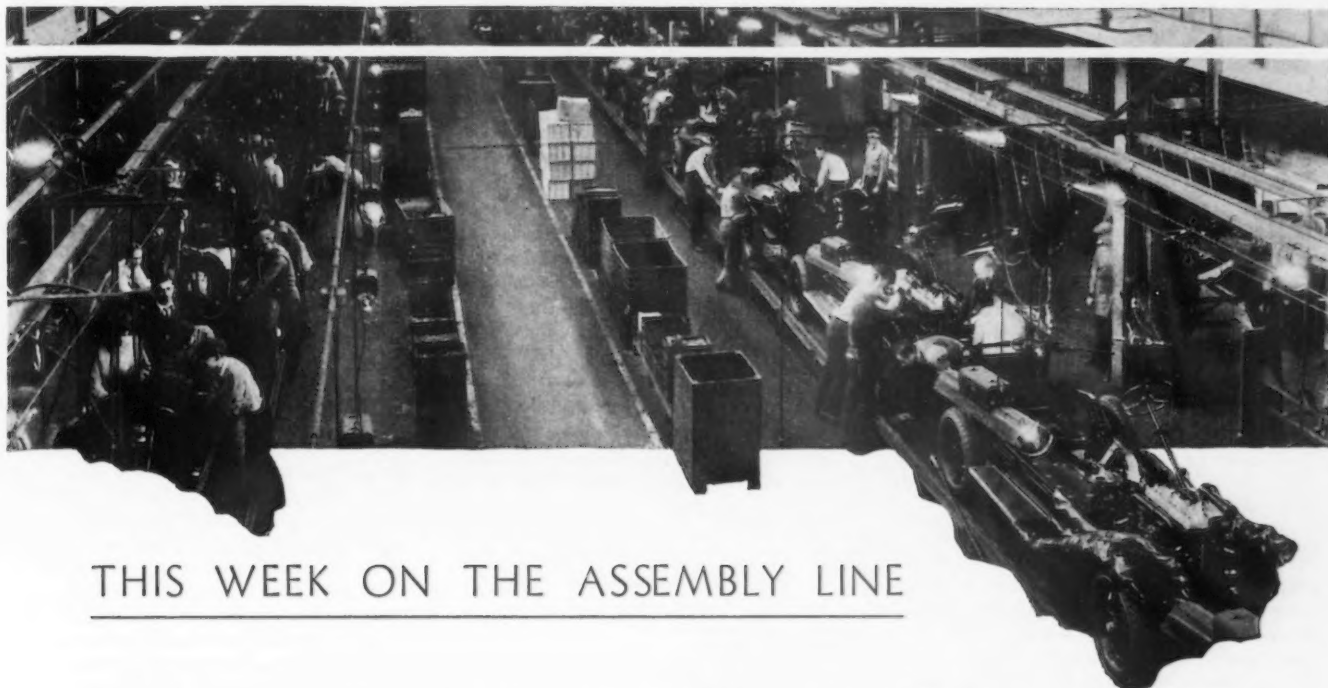
Irrigation and Drainage Refinancing

LOANS for refinancing two irrigation districts in Cal., two drainage districts in each of the States of South C. and Miss., a drainage district in Fla. and one in Ark., a levee district in Mo., and a drainage and levee district in Ill., totaling \$2,151,682.50, have been authorized by the RFC, making a total of \$22,760,834.44 authorized to date by the corporation under the provisions of section 36 of the Emergency Farm Mortgage Act of 1933 as amended.

The 10 districts are:

| | |
|------------------------------------------------------------------------------------|--------------|
| Waterford Irrigation District, Waterford, Stanislaus County, California | \$310,000.00 |
| Palo Verde Irrigation District, Blythe, California | 1,043,582.50 |
| Atkins Drainage District, Bishopville, Lee County, South Carolina | 31,000.00 |
| Dillon Catfish Drainage District, Dillon, Dillon County, South Carolina | 24,000.00 |
| Lake Cormorant Drainage District, Hernando, DeSoto and Tunica Counties, Miss. | 280,000.00 |
| Pompey Lake Drainage District, Sledge, Quitman and Tunica Counties, Miss. | 132,500.00 |
| Davenport Drainage District, Haines City, Polk County, Florida | 23,600.00 |
| Boone County Levee District No. 1, Columbia, Boone County, Missouri | 16,000.00 |
| Chicot County Drainage District, Lake Village, Chicot County, Arkansas | 191,000.00 |
| South Beardstown Drainage & Levee District, Rushville, Cash County, Illinois | 100,000.00 |

The General Electric Co. booked orders valued at \$142,770,800 in 1933, compared with \$121,725,000 in 1932. Orders for the quarter ended Dec. 31 amounted to \$37,985,800, which was a 39 per cent improvement over the \$27,351,700 worth of orders taken in the last quarter of 1932.



THIS WEEK ON THE ASSEMBLY LINE

Motor Car Output Slowly Expanding; Chevrolet Places Steel Orders

DETROIT, Jan. 16.

ALTHOUGH the New York automobile show can scarcely be considered an accurate barometer of what the motor car industry may expect in 1934, the significance of the unusually large attendance, which broke all records on opening day, should not be overlooked. It confirmed the belief of manufacturers that the public is hungry for new cars and will loosen its purse strings considerably to satisfy its appetite.

Further cheer is derived from the fact that production of important companies is expanding. While the daily output of most makers continues erratic, one day reaching a respectable figure and the next day sinking to an insignificant volume, good progress is being made in overcoming operating troubles. That car manufacturers foresee an end to their production difficulties in the not too distant future is shown by their concern that within the next 30 days they may not be able to secure steel as quickly as they wish it.

Chevrolet Buys Steel For Flint Plant

An improvement in steel buying is the best indication that the manufacturing "bugs" in the new jobs shortly will be eliminated. Chevrolet purchased sheets and strip steel for about 60,000 units the past week for delivery to its Flint, Mich., plant. Orders are reported to have totaled roughly 15,000 tons and are to be shipped by

the mills within the next week to 10 days. Fisher Body likewise gave steel releases for its Flint plants and for plant 37 in Detroit. Fisher will place some attractive steel business for its Cleveland plant in the next two weeks.

Even Chrysler, with its factory buildings, warehouses and yards stacked high with steel, bought small fresh tonnages the past week. Ford was in the market mostly for full-finished second sheets which it took in liberal quantities from local brokers. Whether Ford's action was inspired by a sudden shortage of certain sheet sizes because of an unexpected increase in production or by the desire to save money is not known. The fact is that Ford can buy cold-rolled second sheets at a lower price than the so-called Ford steel, which is a hot-rolled pickled and box annealed sheet, and the finish is superior.

Still the only low-price manufacturer in a position to make immediate delivery of cars, Ford has stepped up operations several times in recent weeks and hopes to turn out upward of 57,000 units in January. Now at close to 2500 units a day, Ford is planning on boosting schedules to 3100 cars and finally to 4000, unless there should be an unanticipated slip in sales. It is making at present almost half the industry's total output.

Early in February Ford will reopen assembly plants at Dallas, Tex., and Norfolk, Va., making a total of

10 assembly plants in operation. The Rouge works, employing over 34,000 men, is working five days a week. Having run up the unprecedented attendance of 3,500,000 at its Detroit and New York shows, Ford is said to be considering a contract to stage a similar show at the Century of Progress in Chicago when it reopens next summer. Ford's radio and advertising programs for the spring season are of impressive proportions.

General Motors and Chrysler probably have tentative production rates set up, but in view of manufacturing troubles they are meaningless. Neither corporation has the slightest idea today of what its total output for January will be. Both are struggling to get out as many cars as is possible, working 24 hr. a day with no cessation on Saturdays and Sundays.

Knee-Action Construction Delays Chevrolet

Chevrolet is continuing to have trouble in making parts going into the "knee-action" construction, particularly the welded steel housing. The parts are being made at the local gear, axle and forge plant and shipped to Flint, where the entire front unit, including the inclosed coil springs, the steel sections, the "wish-bones" and brake drums, are assembled. The assembled units then are sent to Chevrolet's branch assembly plants. Assembly of all front ends at Flint assures a uniformity in quality

and workmanship which might be hard to achieve in nine different plants. Such uniformity and rigid manufacturing control are especially desirable at this time, when knee-action design is new to production workers.

Front-end construction is not alone a General Motors bugaboo, but is causing delays at Plymouth and Dodge. Practically all of the intricate parts of independent wheel suspension are forgings for which dies have to be made, and it is understood that both Plymouth and Dodge have been materially held back by late delivery of dies. Plymouth reports orders on hand for 34,000 cars and Dodge for 15,000, but these figures mean little. In both cases it takes considerably more cars than that to stock dealers.

Long delays in getting into production are apt to hurt Plymouth more than Chevrolet. That is, the latter, once its problems are mastered, can easily turn out 4000 cars a day if desirable, but Plymouth's limited factory capacity makes it hard to get above an average of 1600 to 1700 cars a day.

Chrysler and De Soto Make no Delivery Promises

Chrysler salesmen at the shows are reported to be making no delivery promises on the Airflow DeSoto and Chrysler cars. It is said that volume production on these cars will not be attained until well into March. It probably will be March before the Oldsmobile Six is being furnished to dealers.

Much has been said about dies made in outside shops not fitting the presses when they were delivered to automobile plants. Perhaps most of the blame can be laid at the door of independent die makers, but not all of it. There are specific cases on record where motor car companies supplied blue prints of dies, die makers said that the prints were wrong and the dies would not work, automobile production executives insisted upon the dies being built, and when the dies were completed they were so far away from the necessary specifications for the job that they had to be discarded and the work started over again with new drawings.

Not the least of the worries of some companies are the changes which must be made in production facilities if the type of frame construction used by DeSoto and Chrysler for their Airflow models takes hold. It will be recalled that the new design calls for a single all-steel unit, with the body trussed with steel girders like a bridge. Passengers ride inside the frame instead of over it, this type of construction being far more rigid than the conventional type.

Bodies cannot be made in a separate plant and then lowered onto the chassis as heretofore, for the body

and chassis are built up together along one assembly line. This necessitates a revolutionary change in the design of the assembly line, a change which already has been made for DeSoto and Chrysler production at Chrysler's local Jefferson Avenue plant.

It is asserted that Chrysler officials will watch the public's reaction to the Airflow cars in the next three or four months and if there is as favorable a response as they expect, they will change over the Plymouth and probably the Dodge accordingly. Assembly lines for both cars can be re-vamped for the new type frame construction at a minimum cost.

However, all the General Motors plants are set up on the basis of a Fisher Body plant adjacent to them. If General Motors should be compelled to follow Chrysler's lead in going over to the new frame-and-body design, it would have to scrap its present system and establish a new one. While such action is no certainty, the fact that it is even a remote possibility is said to have given certain General Motors officials a case of jumpy nerves.

Ford Still Buying Special Hot-Rolled Annealed Sheets

It was believed that with the adoption of the steel code, the use of so-called Ford steel would be discontinued. Certain provisions were written into the code which it was thought would eliminate the practice of some mills of furnishing Ford with a hot-rolled pickled and box annealed sheet for body stampings and other parts which long had been stamped from cold-rolled sheets.

However, it is now disclosed that at least three mills filed with the Iron and Steel Institute a fourth quarter price of 2.55c., Pittsburgh, on this grade of sheets. Efforts to secure a withdrawal of this item were of no avail. Thus the Ford Motor Co. has continued the purchase of this special sheet, sources of supply long close to Ford furnishing sizable tonnages with the permission of the institute. The quotation of 2.55c. on this item has been carried over for the first quarter.

It will be remembered that other large steel users in the automobile industry investigated the advisability of buying so-called Ford steel, but decided that the extra work which they would have to put on it as compared with what they are doing now with cold-rolled sheets would not justify its purchase. The price of 2.55c., which is only \$4 a ton lower than light cold-rolled sheets, is not sufficient inducement to change. The steel industry, of course, would look with apprehension upon any swing toward such material, in view of the heavy investments in cold-rolled mill equipment.

The Buick offices in Flint again was the meeting place for the machine

tool industry the past week. What is believed to be the final batch of orders for equipment for the new small Buick was placed. This included a battery of 12 hobbing machines to be built by a Rockford, Ill., maker. In establishing a gear cutting line, Buick is taking equipment formerly employed by the Muncie Products division of General Motors. It also is reported to be drawing on machinery from the Brown Lipe Chapin division at Syracuse, N. Y., recently discontinued, and from the old Oakland plant at Pontiac, Mich., which is said to contain some modern machinery.

Buick is going full speed ahead with its tooling-up program for the small job. Executives and purchasing officials are working nights and Sundays, and in some cases the rush apparently has necessitated the disregard of promises. That is, machine tool builders have been given jobs on which to figure and been told to have bids in by a specified date. Laboring night and day to submit prices at the stated time, they have found, when submitting prices at the specified time, that the business was placed the previous day. The only consolation offered was a half-hearted apology.

Aside from its large machine tool purchases, Buick now has on a tool and die program for the small car costing over \$1,000,000. Orders are to be placed this week.

Prediction of the January output for the industry still amounts to little more than a hazardous guess. Assemblies should top 100,000 units, and may reach 125,000, but the volume is dependent on what progress occurs in the final two weeks of the month. February, however, should easily go beyond 200,000 units.

Detroit Notes

R. E. Olds, automotive veteran, is back in active service as head of the Reo Motor Car Co. Reo's orders for forgings are reported to be the largest in several years. . . . Chrysler Corp. made the following shipments in 1933: Plymouth, 261,328 units; Dodge, 96,148 units; Dodge commercial cars, 38,831 units; Chrysler and DeSoto, 52,390 units. The corporation's total of 448,697 units surpassed its 1929 output by 442 units. . . . The American Automotive Co. has been formed at Indianapolis to take over part of the plant, equipment and inventory of the defunct Marmon Motor Car Co. and to make the Marmon 16-passenger car, Miller racing cars and high-speed aviation and marine engines.

Buick's production of its current series has reached 360 cars a day. Its January schedule is 9000 cars, which it is believed will be attained. . . . Nash shipped 3800 cars in December, the largest number for that month since 1926. . . . Lincoln has increased its February program to 400 of its 12-cylinder cars, while daily output during the remainder of January has been stepped up 20 per cent.

SUMMARY OF THIS WEEK'S BUSINESS

Steel Production Rises Two Points To 33 Per Cent of Capacity

Heavier Sheet Specifications from the Automobile Industry and Increased Miscellaneous Business Are Factors—Scrap Higher

STEEL output is showing a more rapid recovery than had been expected following the heavy shipments that were made against expiring contracts in December. Production for the country at large has risen two points to 33 per cent and is only four points below the rate that prevailed in the final week of last month, when pressure to turn out material against lower-priced commitments was at its height.

Part of the rebound in operations is undoubtedly accounted for by replenishment of depleted stocks of ingots, semi-finished steel and finished products. At Chicago, where such restocking has been completed, production has fallen off three points to 29 per cent of capacity. At other important producing centers, however, output has increased, suggesting that rebuilding of inventories does not fully explain the current buoyancy of operations. Yet actual increases in bookings are confined mainly to heavier sheet specifications from the automotive industry and a larger aggregate volume of small orders from miscellaneous sources.

THE heavy tonnage business that the steel industry expects to get from the motor car builders, the railroads and the building industry has not reached the mills. Production problems arising from the adoption of new front construction are still delaying the operations of all the leading automobile makers with the exception of Ford. Governmental red tape and demands for collateral against Federal loans are impeding the release of rail tonnage already ordered. Bids on Government-financed railroad equipment programs have been postponed pending the adoption of a carbuilders' code. Public works construction awards are still light compared with the tonnage releases looked for when the numerous projects now in various stages of progress finally reach the contracting stage. Structural lettings for the week, at 9850 tons, are the lowest since mid-November and compare with 30,140 tons a week ago.

DESPITE delays, there is no question about the support that steel output will eventually get from the "big three"—the automobile industry, the railroads and construction. It is this favorable prospect, no doubt, which accounts for the continued strength of the scrap market. An advance at Pittsburgh has raised THE IRON AGE composite for heavy melting

steel from \$11.58 to \$11.83 a gross ton, its eighth consecutive weekly advance.

The Santa Fe, which last year announced its intention of purchasing 50,000 tons of rails, has bought a total of 34,700 tons. It also distributed orders for 3800 tons of tie plates, 5800 kegs of spikes and 1600 kegs of bolts. The Illinois Central has obtained the Commerce Commission's approval of a Federal loan to finance orders for 21,600 tons of 112-lb. rails and heavy repairs to 16,015 freight cars and 228 passenger cars. The New Haven has obtained a PWA allotment for the purchase of 50 passenger cars. Receivers of the St. Louis-San Francisco have asked court permission to apply for a Federal loan to finance orders for 26,000 tons of rails. The Van Sweringen railroads have postponed until Jan. 22 the taking of bids on 12,745 cars.

TIN plate production is lagging, following heavy shipments against expiring contracts last month. Current mill activity, which ranges from a low of 20 per cent to a high of 50 per cent, is supported in part by export business.

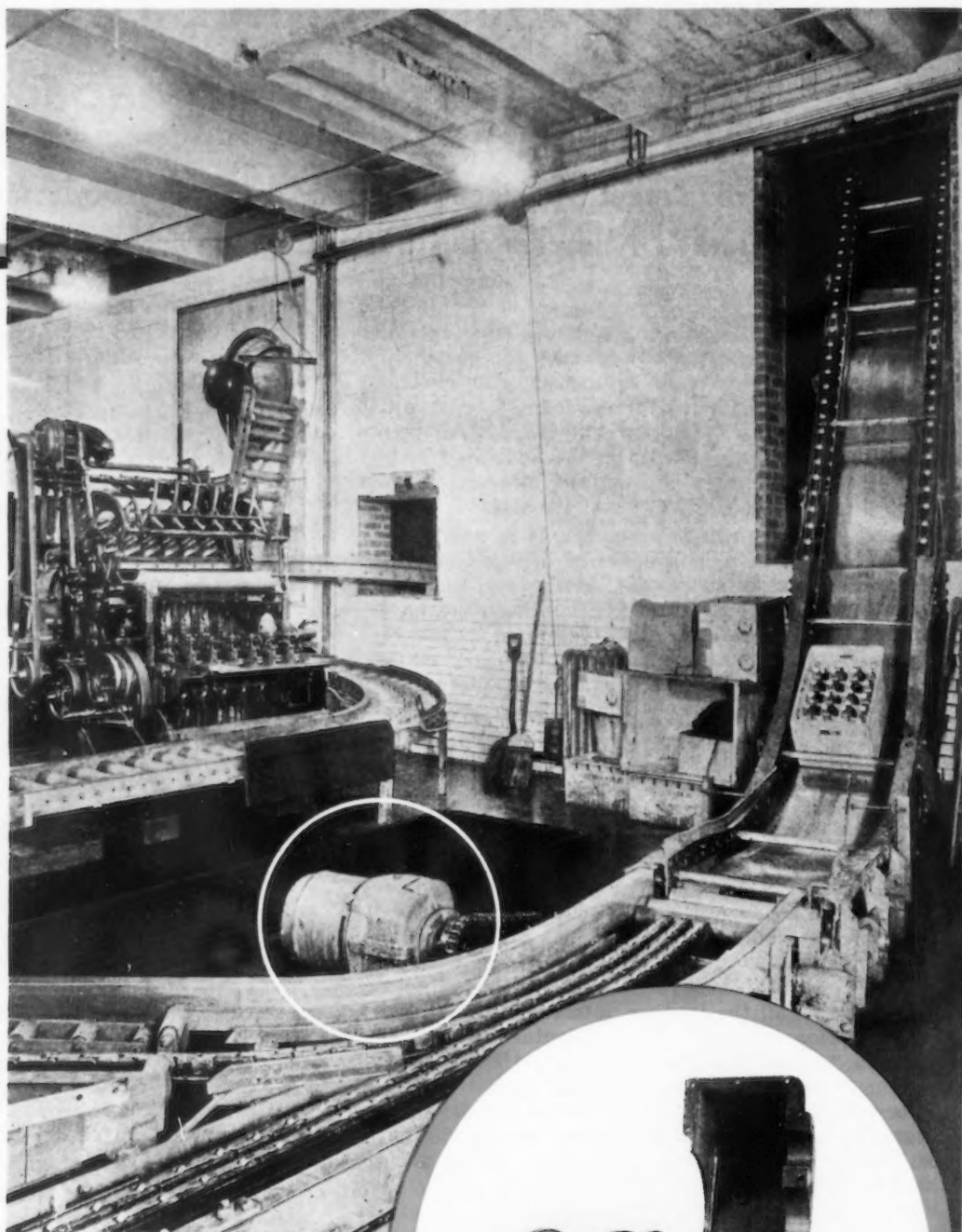
No further changes in steel prices are in immediate prospect, although there is some talk of an advance on semi-finished material in line with recent increases in the prices of heavy finished products. The elimination of the present \$1 a ton differential between Chicago and Pittsburgh base prices on plates, shapes and bars is mentioned as a possible development during the course of the current year. THE IRON AGE composite prices of pig iron and finished steel are unchanged at \$16.90 a ton and 2.028c. a lb. respectively.

Furnace coke at Connellsville has declined 25c. a ton to \$3.50, ovens.

THE decline in steel output at Chicago was the only one reported. Operations rose two points to 24 per cent at Pittsburgh, three points to 25 per cent in the Philadelphia district, six points to 36 per cent in the Valleys, three points to 50 per cent at Cleveland, five points to 55 per cent in the Wheeling territory, and seven points to 84 per cent at Detroit. The Southern rate is unchanged at 50 per cent and the Buffalo average remains at 30 per cent.

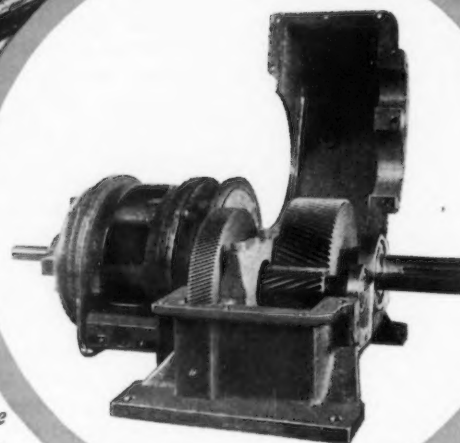
A Pittsburgh district steel producer plans to resume operations this week at one of its blast furnaces. A merchant stack at Toledo has been banked.

GET THE EXTRA A



Above—A Westinghouse double-reduction Gearmotor provides a simple, effective drive for this modern brewery conveyor.

Right—Exposed view of a Westinghouse double-reduction Gearmotor. Anti-friction bearings and single helical gears are used on all units, assuring high efficiency.



A ADVANTAGES OF UNITARY POWER ... *when you buy Gearmotors*

Plus

YOU can save in space, power, initial cost and installation with practically every type of gearmotor . . . but with Westinghouse gearmotors you get extra advantages of Unitary Power.

Unitary Power means simply that the *complete* Westinghouse gearmotor—motor and speed reducer—is designed and rated as a *single unit* and built by *one* manufacturer.

The rigid cast frame, gearing parts and sturdy bearings are made strong enough to take or transmit loads equal to the maximum torque of the motor. Even if the power take-off is by sprocket, pulley or gear, with a diameter as small as twice that of the output shaft, the standard gearmotor will transmit the load. The gears and shafts are heat treated by the famous BPT process and will remain smooth . . . quiet . . . and economical in operation.

Standard Westinghouse gearmotors are available in ratings from $\frac{1}{2}$ to 75 hp., equipped with general purpose motors or with such modifications as splash-proof, totally-enclosed, or explosion tested types. For applications requiring special motors, gearing parts are furnished which will transmit the peak load capacity of the motor.

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THIS **4** WAY
SAVING



A gearmotor takes only $\frac{1}{2}$ to $\frac{3}{4}$ the space required for separate motor and speed reducer.



Mounting and aligning time is cut in half, because there is only one unit to install.



The greater efficiency of a high-speed motor is made available for low-speed drives.



Elimination of bed plates and couplings means an appreciable saving in first cost.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

| | Jan. 16, 1934 | Jan. 9, 1934 | Dec. 19, 1933 | Jan. 17, 1933 |
|------------------------------------------|------------------|-----------------|------------------|------------------|
| <i>Per Gross Ton:</i> | | | | |
| No. 2 fdy., Philadelphia.... | \$19.26 | \$19.26 | \$19.26 | \$13.34 |
| No. 2, Valley furnace..... | 17.50 | 17.50 | 17.50 | 14.50 |
| No. 2 Southern, Cin'ti..... | 18.13 | 18.13 | 18.13 | 13.82 |
| No. 2, Birmingham†..... | 13.50 | 13.50 | 13.50 | 11.00 |
| No. 2 foundry, Chicago*.... | 17.50 | 17.50 | 17.50 | 15.50 |
| Basic, del'd eastern Pa..... | 18.76 | 18.76 | 18.76 | 13.50 |
| Basic, Valley furnace..... | 17.00 | 17.00 | 17.00 | 13.50 |
| Valley Bessemer, del'd P'gh.. | 19.76 | 19.76 | 19.76 | 16.89 |
| Malleable, Chicago*..... | 17.50 | 17.50 | 17.50 | 15.50 |
| Malleable, Valley..... | 17.50 | 17.50 | 17.50 | 14.50 |
| L. S. charcoal, Chicago..... | 23.54 | 23.54 | 23.54 | 23.17 |
| Ferromanganese, seab'd car- lots..... | 85.00 | 85.00 | 82.00 | 68.00 |

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

†This quotation is for delivery in South; in the North prices are 35c. a ton under delivered quotations from nearest Northern furnace.

Rails, Billets, etc.

| | | | | |
|--------------------------------|-------------|-------------|-------------|---------|
| <i>Per Gross Ton:</i> | | | | |
| Rails, heavy, at mill..... | \$36.37 1/2 | \$36.37 1/2 | \$36.37 1/2 | \$40.00 |
| Light rails, Pittsburgh..... | 32.00 | 32.00 | 32.00 | 30.00 |
| Re-rolling billets, Pittsburgh | 26.00 | 26.00 | 26.00 | 26.00 |
| Sheet bars, Pittsburgh..... | 26.00 | 26.00 | 26.00 | 26.00 |
| Slabs, Pittsburgh..... | 26.00 | 26.00 | 26.00 | 26.00 |
| Forging billets, Pittsburgh.. | 31.00 | 31.00 | 31.00 | 31.00 |
| Wire rods, Pittsburgh..... | 36.00 | 36.00 | 36.00 | 35.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb.. | 1.60 | 1.60 | 1.60 | 1.60 |

Finished Steel

| | Cents | Cents | Cents | Cents |
|---------------------------------|----------|----------|----------|---------|
| <i>Per Lb.</i> | | | | |
| Bars, Pittsburgh..... | 1.75 | 1.75 | 1.75 | 1.60 |
| Bars, Chicago..... | 1.80 | 1.80 | 1.80 | 1.70 |
| Bars, Cleveland..... | 1.80 | 1.80 | 1.80 | 1.65 |
| Bars, New York..... | 2.08 | 2.08 | 2.08 | 1.95 |
| Plates, Pittsburgh..... | 1.70 | 1.70 | 1.70 | 1.60 |
| Plates, Chicago..... | 1.75 | 1.75 | 1.75 | 1.70 |
| Plates, New York..... | 1.98 | 1.98 | 1.98 | 1.798 |
| Structural shapes, Pittsburgh | 1.70 | 1.70 | 1.70 | 1.60 |
| Structural shapes, Chicago... | 1.75 | 1.75 | 1.75 | 1.70 |
| Structural shapes, New York | 1.95 1/4 | 1.95 1/4 | 1.95 1/4 | 1.86775 |
| Cold-finished bars, Pittsburgh | 2.10 | 2.10 | 2.10 | 1.70 |
| Hot-rolled strips, Pittsburgh.. | 1.75 | 1.75 | 1.75 | 1.45 |
| Cold-rolled strips, Pittsburgh. | 2.40 | 2.40 | 2.40 | 1.90 |

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Finished Steel

| | Jan. 16, 1934 | Jan. 9, 1934 | Dec. 19, 1933 | Jan. 17, 1933 |
|--------------------------------------------------------------|------------------|-----------------|------------------|------------------|
| <i>Per Lb.</i> | | | | |
| Hot-rolled annealed sheets, No. 24, Pittsburgh..... | 2.25 | 2.25 | 2.25 | 2.00 |
| Hot-rolled annealed sheets, No. 24, Chicago dist. mill... | 2.35 | 2.35 | 2.35 | 2.10 |
| Sheets, galv., No. 24, P'gh... | 2.85 | 2.85 | 2.85 | 2.65 |
| Sheets, galv., No. 24, Chicago dist. mill..... | 2.95 | 2.95 | 2.95 | 2.75 |
| Hot-rolled sheets, No. 10, P'gh | 1.75 | 1.75 | 1.75 | 1.45 |
| Hot-rolled sheets, No. 10, Chi- cago dist. mill..... | 1.85 | 1.85 | 1.85 | 1.55 |
| Wire nails, Pittsburgh..... | 2.35 | 2.35 | 2.35 | 1.80 |
| Wire nails, Chicago dist. mill. | 2.40 | 2.40 | 2.40 | 1.85 |
| Plain wire, Pittsburgh..... | 2.20 | 2.20 | 2.20 | 2.10 |
| Plain wire, Chicago dist. mill | 2.25 | 2.25 | 2.25 | 2.15 |
| Barbed wire, galv., P'gh..... | 2.85 | 2.85 | 2.85 | 2.30 |
| Barbed wire, galv., Chicago dist. mill..... | 2.90 | 2.90 | 2.90 | 2.35 |
| Tin plate, 100 lb. box, P'gh... | \$5.25 | \$5.25 | \$5.25 | \$4.25 |

Scrap

| | | | | |
|--------------------------------|---------|---------|---------|--------|
| <i>Per Gross Ton:</i> | | | | |
| Heavy melting steel, P'gh... | \$13.25 | \$12.50 | \$12.50 | \$8.25 |
| Heavy melting steel, Phila... | 11.75 | 11.75 | 10.75 | 6.75 |
| Heavy melting steel, Ch'go... | 10.50 | 10.50 | 8.75 | 5.25 |
| Carwheels, Chicago..... | 11.00 | 10.50 | 9.50 | 7.75 |
| Carwheels, Philadelphia..... | 11.75 | 11.75 | 10.75 | 8.00 |
| No. 1 cast, Pittsburgh..... | 11.75 | 11.25 | 11.25 | 9.00 |
| No. 1 cast, Philadelphia..... | 12.50 | 12.50 | 12.75 | 8.00 |
| No. 1 cast, Ch'go (net ton)... | 9.50 | 9.50 | 8.50 | 6.25 |
| No. 1 RR. wrot., Phila..... | 11.00 | 11.00 | 11.00 | 7.50 |
| No. 1 RR. wrot., Ch'go (net) | 9.00 | 8.75 | 7.50 | 4.50 |

Coke, Connellsville

| | | | | |
|-----------------------------|--------|--------|--------|--------|
| <i>Per Net Ton at Oven:</i> | | | | |
| Furnace coke, prompt..... | \$3.50 | \$3.75 | \$3.75 | \$1.75 |
| Foundry coke, prompt..... | 4.25 | 4.25 | 4.25 | 2.50 |

Metals

| | Cents | Cents | Cents | Cents |
|---------------------------------|-----------|-------|-------|----------|
| <i>Per Lb. to Large Buyers:</i> | | | | |
| Electrolytic copper, refinery.. | 7.75 | 7.75 | 8.00 | 4.75 |
| Lake copper, New York..... | 8.00 | 8.00 | 8.25 | 5.00 |
| Tin (Straits), New York..... | 52.37 1/2 | 52.00 | 53.20 | 22.70 |
| Zinc, East St. Louis..... | 4.25 | 4.25 | 4.50 | 3.00 |
| Zinc, New York..... | 4.60 | 4.60 | 4.85 | 3.37 |
| Lead, St. Louis..... | 3.90 | 3.90 | 4.05 | 2.87 1/2 |
| Lead, New York..... | 4.00 | 4.00 | 4.15 | 3.00 |
| Antimony (Asiatic), N. Y... | 7.20 | 7.25 | 7.25 | 6.00 |

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

| | |
|---------------|---------------|
| Jan. 16, 1934 | 2.028c. a Lb. |
| One week ago | 2.028c. |
| One month ago | 2.028c. |
| One year ago | 1.923c. |

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

| | HIGH | LOW |
|-----------|-------------------|------------------|
| 1933..... | 2.036c., Oct. 3; | 1.867c., Apr. 18 |
| 1932..... | 1.977c., Oct. 4; | 1.926c., Feb. 2 |
| 1931..... | 2.037c., Jan. 13; | 1.945c., Dec. 29 |
| 1930..... | 2.273c., Jan. 7; | 2.018c., Dec. 9 |
| 1929..... | 2.317c., April 2; | 2.273c., Oct. 29 |
| 1928..... | 2.286c., Dec. 11; | 2.217c., July 17 |
| 1927..... | 2.402c., Jan. 4; | 2.212c., Nov. 1 |

Pig Iron

| |
|---------------------|
| \$16.90 a Gross Ton |
| 16.90 |
| 16.90 |
| 13.56 |

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

| | HIGH | LOW |
|-----------|-----------------|----------------|
| 1933..... | 16.90, Dec. 5; | 13.56, Jan. 3 |
| 1932..... | 14.81, Jan. 5; | 13.56, Dec. 6 |
| 1931..... | 15.90, Jan. 6; | 14.79, Dec. 15 |
| 1930..... | 18.21, Jan. 7; | 15.90, Dec. 16 |
| 1929..... | 18.71, May 14; | 18.21, Dec. 17 |
| 1928..... | 18.59, Nov. 27; | 17.04, July 24 |
| 1927..... | 19.71, Jan. 4; | 17.54, Nov. 1 |

Steel Scrap

| |
|---------------------|
| \$11.83 a Gross Ton |
| 11.58 |
| 10.67 |
| 6.75 |

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

| | HIGH | LOW |
|-----------|-----------------|----------------|
| 1933..... | 12.25, Aug. 8; | 6.75, Jan. 3 |
| 1932..... | 8.50, Jan. 12; | 6.42, July 5 |
| 1931..... | 11.33, Jan. 6; | 8.50, Dec. 29 |
| 1930..... | 15.00, Feb. 18; | 11.25, Dec. 9 |
| 1929..... | 17.58, Jan. 29; | 14.08, Dec. 3 |
| 1928..... | 16.50, Dec. 31; | 13.08, July 22 |
| 1927..... | 15.25, Jan. 11; | 13.08, Nov. 22 |

Operations Rise Further In Pittsburgh District



Steel Output Also Higher in Valleys and in Wheeling Dis- trict—Scrap Market Advances

PITTSBURGH, Jan. 16.—Although there has been no marked increase in finished steel orders in the past week, nevertheless an unusually steady flow of miscellaneous business has been sufficient to boost the Pittsburgh ingot output two points to 24 per cent of capacity. Production in the valleys and nearby northern Ohio mills has picked up six points, and this week is averaging 36 per cent. A further advance in the Wheeling district brings the current average to 55 per cent.

The increased activity in the Pittsburgh area has been accomplished without notable support from the automotive industry or from railroad buying. A slightly improved demand for automobile sheets is noticeable, but the movement of other classes of steel to the automotive industry has not yet gathered momentum since the beginning of the year. Important rail and track accessory business has not recently been reported in the Pittsburgh district. Steel makers, however, are considerably heartened by the fact that, with the recent improvement in miscellaneous consumption of steel, the heavy tonnage now in sight from the railroad buying program, expected renewal of automotive demand and furtherance of public works programs, the latter part of the first quarter should witness a sharp expansion in steel production.

Tin plate production is lagging and does not share the immediate outlook for other products. Sheet mills are slightly more active this week at 30 per cent of capacity. Pipe mill production is largely sustained by a fairly steady demand for oil country goods. Wire mills lack orders as a consequence of the heavy protective covering in December, but expect a pick-up next month when seasonal agricultural demand is due. Bar mills are not particularly active, but orders for merchant bars are well diversified. Structural and plate departments are slightly busier. New structural business, however, fell off noticeably in the past week.

An independent steel producer plans to resume operation this week of a blast furnace which has been banked for some time.

Activity in scrap prices may be barometric of the early course of steel. Scrap prices are very firm, and major grades have advanced.

Pig Iron

Important first quarter buying has not yet appeared. Small users with limited capital continue to buy on a spot basis. Large consumers, some of which have been expected momentarily to cover their basic requirements, continue to withhold interest from the market. An improved demand for ingot molds has failed to appreciably affect the movement of pig iron.

Semi-Finished Steel

Non-integrated mills are not actively interested in semi-finished grades. Talk of higher prices on certain grades is spreading, perhaps largely because recent advances on plates, shapes and bars were made without a compensatory adjustment in semi-finished steel. No higher prices are considered to be in immediate prospect; at least not for the first quarter.

Bars

Demand for soft steel merchant bars, though quiet, is fairly well spread. Despite the unusually heavy covering in December, the aggregate movement in the first half of January exceeded the expectations of producers. Further large-scale buying, however, will likely await substantial shrinkage of present consumer stocks, crystallization of railroad business, and accelerated production in the automotive industry. All first quarter business is being quoted at 1.75c., Pittsburgh.

Fresh specifications for reinforcing bars are unimportant in this district. The Pittsburgh post office ramps, which will require about 500 tons of concrete bars or rail steel, are being refigured. Pending dam work constitutes the only other major projects for early letting.

Plates and Shapes

Demand for plates is quiet. A fair tonnage of armor plate is expected to be placed shortly by the Government. No important tonnage from the carriers or railroad equipment manufac-

turers has yet reached plate producers. Projected barge work is negligible. About 375 tons of plates will be used in constructing a gasoline barge, which will be electric welded at Pittsburgh and erected at Wilmington, Del. The United States Engineer office at Kansas City, Mo., is inquiring for 10 steel pontoons, which will require only 100 tons of plates. The Pittsburgh base of 1.70c. is quotable through first quarter.

Structural steel inquiries were in greater evidence in the past week, while awards fell off rather sharply. Very little new private work can be accounted for, and fresh specifications with few exceptions related to public construction projects. A bridge over the Missouri River at Fort Peck Dam, Mont., taking 2000 tons, is the largest inquiry reported here for the week. Foundations for the Library of Congress in Washington, involving 750 tons, represent the largest letting.

Wire Products

Very little tonnage has been booked since the beginning of the year. Jobbers are generally well stocked with wire products purchased against fourth quarter contracts. A seasonal demand from the agricultural areas is in the making, but no active interest from that source is expected before next month. Increased farm purchasing power is expected to stimulate a heavier movement of merchant wire products this year. With its production schedule lagging, the automotive industry has not yet revealed its full first quarter requirements of manufacturers' wire.

Tubular Products

The United States Engineer office at Kansas City, Mo., is taking bids until Feb. 3 on about 3700 tons of 28 x 3/4-in. steel butt welded pipe, and approximately 300 tons of elbow joints. Other inquiry is generally restricted as to tonnage. The steady character of demand for oil country goods is an encouraging feature in this market. Interest in seamless boiler tubes and mechanical tubing is rather meager.

Sheets

Demand continues to improve. Although miscellaneous consumers account largely for the current pickup, the needs of important consuming groups also are beginning to expand, though slightly. Some automobile makers, whose stocks are not so heavy as the general rule, are beginning to specify more frequently. High-carbon sheets are in good demand for implement manufacture coincidental with CWA programs. Flue pipe and welding apparatus manufacturers are fairly active in the present market. Several thousand tons of sheets are estimated as the requirements for freight and passenger cars being inquired for by the Van Sweringen lines. Mills are operating slightly

higher this week at 30 per cent of capacity.

Tin Plate

The leading producer in this district is engaged this week at about 50 per cent of capacity, with independents at 20 to 25 per cent. Rolling is in all cases against actual orders, and practically no tin plate is being produced for stock. Export business is contributing to current mill activity. New orders are slow in coming in, and very little improvement is expected for some weeks.

Rails and Track Accessories

Although this market is momentarily quiet, some substantial orders are on the brink of fulfillment. Completion of final details governing the Federal loan to the Pennsylvania Railroad will probably permit early placement of steel tonnage. In some cases, however, deliberations in arranging Federal loans are tending to obstruct a good deal of rail and track accessory inquiry of a specific character. The slow progress toward actual orders probably accounts for the fact that the total rail and fastenings business thus far placed with mills is rather insignificant in relation to the total tonnage which the transportation coordinator originally represented as the combined requirements of the carriers.

Strip Steel

Spot purchasing characterizes activity in this market. Movement to the automotive industry is slightly larger, but far from significant. The recent spurt in orders from implement manufacturers serving CWA camps has temporarily subsided, but replacements are expected to renew demand from that source in the early future. With current incoming business in small volume, mills are forced to operate intermittently.

Cold-Finished Bars

Demand since the beginning of the year has been extremely light, with little change in activity likely until next month, when seasonal interest from agricultural implement manufacturers and increased buying by the automobile trade are expected. The jobbing trade is presumably well covered by heavy takings of cold-finished stock on lower priced fourth quarter contracts. First quarter business is uniformly quotable at 2.10c., Pittsburgh.

Coke and Coal

Furnace coke has been marked down 25c. a ton to a minimum of \$3.50, f.o.b. Connellsville ovens, for shipment during the remainder of January. Connellsville foundry coke is unchanged at \$5.25 for premium brands, and \$4.25 minimum for standard brands, at ovens. Several large-lot purchases of furnace coke have appeared. A non-integrated steel mill

has covered for its first half requirements of blast furnace coke. The pig iron producer at Birdsboro, Pa., has covered for the month on low phosphorous furnace coke, and another eastern Pennsylvania consumer has closed on a substantial tonnage of Fairmont coke for more extended delivery. Regional complications concerning prices under the bituminous coal code have depressed activity in the soft coal market. Occasional spot buying comprises current trading. Labor difficulties in the anthracite regions have not yet exerted an influence on the bituminous market.

Scrap

The No. 1 heavy melting steel on the recent Pennsylvania Railroad list was sold at around \$14 to a broker for delivery to a distant mill. Ap-

proximately \$13.95 was paid by a dealer for rails included on the Pennsylvania list. A mill in a nearby district recently paid \$14.10 for No. 1 railroad steel, and \$13.50 for ordinary No. 1 steel. The higher prices paid on the recent railroad tenders have imparted further strength to prices in this district. Ordinary No. 1 steel is quotably higher at \$13.00 to \$13.50. Similar advances have been scored in No. 2 railroad wrought and scrap rails. Machine shop and short shoveling turnings, at \$8.75 to \$9.25, are up 50c. a ton on active dealer bidding. Heavy, breakable cast is slightly higher at \$11.25 to \$11.75, while No. 1 cast on a recent sale advanced 50c. a ton to \$11.50 to \$12.00. Railroad specialties are up \$1 a ton, and a nominal advance has occurred in low phosphorus billet crops.

Miscellaneous Orders Bolster Valley Operations—Consumers in Protest

YOUNGSTOWN, Jan. 16.—The post-holiday recession in Valley steel mill operations was apparently short-lived. A surprisingly steady influx of miscellaneous orders since the first week in January has necessitated upward revisions in open-hearth, Bessemer and finishing mill schedules.

Ingot output for the current week will probably average around 36 per cent. The leading producer in this district plans to run eight open-hearths and resume partial operations at its Bessemer plant. These units were idle last week. Increased activity in the Shenango Valley is also scheduled for this week, with resumption of 8-in., 9-in. and continuous mills at the Sharon, Pa., plant. A 10-in. mill at that plant will be started tomorrow. Tin plate mills are not sharing in the increased schedules and are barely averaging 25 per cent of capacity.

The diversified character of orders which have been drifting in during the past 10 days provides little evidence for gaging underlying reasons for the unexpected bulge in bookings. Sheets and strip, which began the new year at unchanged prices, are particularly in demand. Moderate bookings of those products have been made for the automotive industry, while additional tonnages are moving to manufacturers of electric refrigerators and miscellaneous lines. Merchant steel bars, which on Jan. 1 were uniformly established at \$3 a ton above the low quotation for fourth quarter, are also moving rather briskly. Alloy steel bars are in demand for automobile manufacture. Government work-creating agencies are also accounting for a fair share of the current movement.

The scrap market is very firm. A large consumer last week purchased a distress lot of No. 1 heavy melting steel at \$12.50 and another parcel at \$12.75. For extended delivery, however, that grade is not procurable in the open market at less than \$13. Recent high prices bid for railroad scrap have tended to stiffen dealer asking prices for No. 1 steel, which in some cases is being quoted at \$13.50 and higher. Corresponding tendencies rule other major grades of scrap. Releases against existing orders are appearing more frequently as a result of expanding open-hearth activity.

Pig iron is relatively quiet. Buying since the first of the year has been restricted to moderate contracting for first quarter. Ingot mold manufacturers are busier. Inquiry for rolling mill equipment is spreading, although no important orders have recently been reported.

Large consumers of flat-rolled steel in the Youngstown district are reported to have filed a protest at Washington against the higher costs exacted by the provisions of the iron and steel code. Under the code, Pittsburgh is the basing point for plates, sheets and strip. In quoting delivered prices on those products, Valley producers must add to the base prices the full freight from Pittsburgh to destination. Prior to the code, Pittsburgh was the basing point, but Valley steel makers usually quoted consumers on a delivered basis that involved only 5c. a 100 lb. for freight. The additional cost to consumers, under the code, it is claimed, is around \$75 a car. Reestablishment of the pre-code method of quoting is therefore being sought.

Chicago Steel Output Falls to 29 Per Cent



Upturn in Business Too Small to Offset Setback Due to Reduced Stocking of Semi-Finished Steel—Santa Fe Buys Rails

CHICAGO, Jan. 16.—Ingot output has dropped three points to 29 per cent of capacity. Mills have replenished their stocks of semi-finished materials and demand for finished steel has shown only a nominal increase.

Among consumers, farm implement manufacturers are holding recent gains in output and are confident that demand for their products will show an early upturn. Automobile plants are swinging into heavier production, though they have by no means attained the operations originally scheduled for January. However, it is the general belief that automotive consumption of steel will increase sharply in the near future. Demand for mill products from the miscellaneous manufacturers is in small volume but, in view of stocks in consumers' hands, does not afford a measure of actual consumption. Industry in the Middle West is clearly headed for moderately greater activity, although most of it is traceable to governmental expenditures. This is true of structural steel, cast iron pipe and reinforcing bar projects and, to a large extent, of many light manufactured products such as small hand tools, wheel barrows, and the like, which are required by men who have been put to work in camps and at miscellaneous odd jobs in practically all communities.

The Santa Fe has ordered about two-thirds of the rail tonnage it was reported to have had in mind late last year. This railroad is today distributing orders for 10,000 tons of track accessories.

Pig Iron

The melt is slowly gaining, with foundries allied with the automobile industry leading the way. The trade expects this tendency to continue, with later participation by the railroad equipment and farm machinery industries. New buying of Northern foundry iron is sluggish and shipments so far in January are below the December rate, as was fully to be expected following the rush to take shipments near the year's end.

Reinforcing Bars

The week is important from the viewpoint of tonnage awarded. How-

ever, the bulk of the steel placed was for dams across the Mississippi River at Saverton, Mo., Alton, Ill., and Muscatine, Iowa. Of outstanding interest in Chicago is 700 tons on inquiry for a sewer, and the fact that the Federal Government has provided funds for completion of the Outer Drive bridges and approaches. Piling may supplant caissons for the approaches, and if so, the tonnage of bars needed will be materially reduced. Nevertheless the project will

Cast Iron Pipe

Orders in attractive volume are scarce and sellers have added little to books in the first half of January. Six towns in the vicinity of Springfield, Ill., have postponed awarding 6500 tons. Lake Forest, Ill., although granted a loan, has taken no action in the pipe market. There is a strong disposition in a number of municipalities to check further expenditures. Delay has again been encountered at Wilmette, Ill., where property owners are insisting that water mains be laid in alleys and not in parkways.

Wire Products

Automobile builders are taking more wire, but other manufacturers are marking time. Reports from rural districts indicate that process tax money is boosting sentiment.

Sheets

Cold-rolled departments are increasing their operations as some automobile plants swing into heavier production. General manufacturing shows little disposition to move forward, but the roofing trade should revive with the approach of spring. Sellers are also expecting to participate in business from country areas that are being benefited by the distribution of process tax money.

Rails and Track Supplies

Of rail orders placed by the Santa Fe, the Colorado mill will roll over 25,000 tons. Illinois 6800 tons and Inland 1700 tons. The total purchase, amounting to 33,800 tons, contrasts with the 50,000 tons it had been hoped the Santa Fe would take. The Illinois Central may close for 20,000 tons this week and the Southern Pacific is expected to take at least 25,000 tons in

the very near future. About 10,000 tons of the recent Missouri Pacific purchase was placed with Chicago mills. The Santa Fe accessory orders, amounting to 10,000 tons, are expected to be distributed momentarily. Recent miscellaneous track supply purchases amount to 3500 tons. Chicago rail mills are idle, there being no releases against recent purchases.

Bars

This market is not taking the leadership usually expected of it, the reason evidently being that tonnages in consumers' hands are quite ample for immediate needs. Some gain is noted in the automobile field, where Ford, Plymouth and Chevrolet are stepping up production. Chicago sellers who have recently been in Detroit bring back the prophecy that the next six months in the automobile trade will be the best since 1930 and that steel purchases will be in proportion.

Plates

Of outstanding interest in this market is an inquiry for 3700 tons of 28-in. pipe for Fort Peck, Mont. The Mississippi River dam program affords the most active current demand for plates. Railroad equipment programs are lagging, one reason being that car builders are working on a code which has not yet been approved. Railroad repair programs are disappointing to mills, there having been much talk but little in the way of real action.

Structural Material

Awards are unusually light, consisting of small miscellaneous jobs that total only about 1000 tons. On the other hand, inquiries are promising, totaling about 13,000 tons. Railroad bridges account for 4200 tons and the remainder consists of Government projects and State highway bridges. Private jobs are as scarce as at any time in the past year. Fabrication of the San Francisco Bay bridge is moving forward rapidly.

Scrap

Sentiment in the scrap trade is mixed. There are those who hold to the idea that prices will continue in an uninterrupted rise, while others contend that the upward surge has about spent itself. One thing is certain and that is consumption is measurably lighter at steel mills and consumers outside of Chicago are drawing supplies from this market without encountering opposition from local consumers. Heavy melting steel and borings are still moving to docks, and it is this phase of the market that remains on a highly speculative level. Some important dealers are on the long side of the market and therefore are in a poor position to give support to a higher price structure. Another factor contributing to sluggish broker activity is the fact that the scrap trade is holding a convention this week at Atlantic City.

Steel Bookings Lag in New York Territory



Specifications for Sheets and Merchant Pipe More Active Than for Other Products — Export Demand Better

NEW YORK, Jan. 16.—Steel bookings fell to a low ebb for most companies the last week, although one or two report that specifications to date are higher than for the corresponding period in December. Sheets and merchant pipe have been in more active demand than products for which low-price contracts terminated in December. Can companies are believed to have accumulated enough steel to take care of their first quarter requirements, but nevertheless tin plate prospects for the year as a whole are regarded as exceptionally good. The canners' convention in session in Chicago this week is expected to give the trade a more definite line on the trend of business in canned goods. But in addition to the traditional outlets for tin plate, there is a steady expansion of business in new directions, foremost among which is its use in small containers at service stations for automobile lubricating oils. Export demand for tin plate is improving and foreign business in pipe is more active.

Bids will be taken Feb. 6 on 1000 tons of reinforcing bars, 4500 tons of structural steel and 350 tons of curb plates, as well as sheet piling required for temporary shoring, for the Midtown Hudson River tunnel, New York.

Late in the month figures will be taken on about 500 tons of structural and reinforcing steel for the Triboro Bridge, New York.

Two tankers placed by the Socony-Vacuum Transportation Co. with the New York Shipbuilding Co. called for 11,400 tons of plates, shapes and bars, which was divided between the Bethlehem Steel Co. and the Carnegie Steel Co.

Pig Iron

Most melters in this district are more concerned with the liquidation of their stocks than with entering new commitments. Consequently the market continues to be dull, and current purchases are limited to carlots of unstocked grades for mixing purposes. Slightly more than 1400 tons was sold during the past seven-day period, compared with 1500 tons booked during the previous week. Tidewater melters are particularly in-

terested in the recently issued Commercial Resolution No. 43, which provides for a reduction in delivered prices not exceeding 60c. a ton for barge and rail-and-water shipments of over 400 tons.

Reinforcing Steel

A fair volume of bars is scheduled to be shipped over the next month for public structures for which orders have already been placed or will be awarded during the next fortnight. La Sala Mason Corp. is low bidder on 400 tons required for the State hospital at Brentwood, L. I.; Joseph T. Ryerson & Son, Inc., will furnish 100 tons for a Suffolk County, N. Y., bridge, and Kalman Steel Co. was awarded 100 tons for a Massachusetts highway bridge. Another section of the Tri-Borough bridge, involving

Buffalo Steel Output Holds at 30 Per Cent

BUFFALO, Jan. 16.—Open-hearth operations are unchanged, with six furnaces active at the Lackawanna plant; four at Republic Steel Corp., and one at Wickwire-Spencer Corp. The Seneca sheet division of Bethlehem remains on a 40 per cent basis.

The building industry is in a lull with very few construction jobs coming out; consequently, no structural or reinforcing bar awards are apparent.

The pig iron market lacks even ordinary activity. No sizable inquiries have come out, and there is only a minimum booking of small lots. Operations of blast furnaces are unchanged.

Only one outstanding scrap transaction has occurred. That was the purchase locally of 1500 tons of mixed borings and turnings for \$7.50. The largest consumer is regulating shipments on its recent new orders, cutting down receipts to a few cars a week. Dealers are being offered \$9.25 by the recipient of a recent sizable order for No. 2 heavy melting steel. A few cars of railroad malleable have been sold at the quoted price.

about 310 tons, will be let on Jan. 19, and over 800 tons of bars will be awarded on Jan. 26 for miscellaneous highway structures in Queens and Nassau counties, N. Y. Proposals must be in by Feb. 6 for over 1000 tons of bars for the Hudson River tunnel between Manhattan and New Jersey.

Scrap

The tone of this market is decidedly stronger as a result of sharp price advances in the Pittsburgh district and the refusal of local producers and dealers to release important tonnages of material. In order to complete boat loadings, brokers are spiritedly bidding for open market supplies, and, in some cases, quiet offers of 25c. to 50c. above the open market have been made for heavy melting grades. Current trading is particularly centered in Jersey City, where \$8.75 and \$7.75, on barge is being paid for No. 1 and No. 2 heavy melting steel respectively for export account. An unsettling influence is the current offer of a large Japanese exporter to resell recent purchases to domestic melters. Unprepared yard iron and steel is now priced at \$4.50 to \$5 a ton, New York, and brokers are paying \$10.75 a ton for steel car axles for delivery to a Lebanon, Pa., consumer. Foundry grades are quotably unchanged but strong. Trading in blast furnace and rolling mill grades is comparatively light, but buying prices are very firm.

Light Products Active In South

BIRMINGHAM, Jan. 16.—Pig iron shipments and bookings have been light since the first of the year. Foundries are well loaded with pig iron and there is not much need for additional purchases or deliveries, except from those that were not able to take advantage of old contracts, and such instances are not numerous. No change in price has taken place, the base still being \$13.50. Nine furnaces are operating, the same as since the first of the year.

Steel

Demand for light products is somewhat better than was expected after the December rush. Structural steel, bar and plate tonnage is close to the same level as last quarter, and not very active. A number of rail inquiries is pending and it is hoped that some additional rail business will be booked at an early date. The St. Louis-San Francisco has announced that it will place 26,000 tons of rails with the Birmingham mill early in February. Twelve open-hearth units have been worked for several weeks and no change is scheduled for next week.

Steel Production Rises In Philadelphia District



**Ingot Output Estimated at 25 Per Cent
This Week — Incoming Specifications
Continue Light — Scrap Market Strong**

PHILADELPHIA, Jan. 16.—Although current orders and specifications for finished steel products are still relatively light, ingot production has risen in this district and is estimated this week at 25 per cent of capacity. Most of the gain is attributable to activity in the Eastern plants of the leading interest, whose order books are still fairly well reinforced with shipbuilding, railroad and public works business. The smaller plants in the district are gaging their operations to meet current demand only, and in most cases are operating one or two open-hearth furnaces each.

With the Pennsylvania Railroad still deferring its expected inquiry for freight car steel, the market is devoid of significant pending tonnage. Other railroads buying in Philadelphia are inactive and some of them anticipate sharp traffic contraction as a result of the anthracite coal strike. This strike has not affected steel buying in the district, although many consumers of steel are dependent on the anthracite fields for their fuel.

Market sentiment continues buoyant and this feeling is reinforced by the pronounced strength in the scrap market. Although no sales at higher levels have been reported, mills are unable to buy at quoted figures, which have become largely nominal.

Pig Iron

Sales are confined to carload lots and no contract buying is reported. Approval of a commercial resolution under the iron and steel code which permits deductions on iron delivered by water to certain large steel and cast iron pipe plants in the district will not stimulate immediate buying by these interests.

Bars, Plates and Shapes

The structural steel market is more active. Bids were taken yesterday on 1500 tons of shapes for the Delaware River bridge subway connection, with Builders, Inc., Philadelphia, apparently low. Competition on the job was keen, with 18 companies submitting bids, the highest of which was almost twice the lowest. The New Jersey section of this project will take 3000 to 4000 tons of steel, with formal inquiry expected in a few weeks. A num-

ber of other small projects are coming out, and demand for reinforcing bars is more active. Demand for plates is quiet, although the Government has taken bids on more than 5000 tons of armor plate.

Imports

The following iron and steel imports were received here last week: 6100 tons of iron ore from Morocco; 802 tons of pig iron from British India; 43 tons of structural shapes, 27 tons of steel bars and 9 tons of steel bands from Belgium; and 49 tons of steel bars from Germany.

Sheets

Miscellaneous demand is somewhat better, although large buyers remain inactive. Mills are of the opinion that smaller users in the district are not heavily stocked and that any acceleration in general business would result in a normal flow of orders. Reports that price advances on sheets are under consideration are having little influence on buyers.

Scrap

This market is exceptionally strong, although mill purchases at higher levels have not been reported. Dealers seem to be unwilling to sell No. 1 heavy melting steel at \$12, and are having difficulty covering old orders at a profit. The other grades of scrap are also strong, but consumer interest is not as active as might be expected because of the light melt reported at most points.

Activity Subsides On Coast

SAN FRANCISCO, Jan. 15.—With few Federal projects in the immediate offing and with inventories being taken, activity during the week was lessened. However, the increase in the number of undertakings involving minor tonnages is believed to forecast heavier lettings toward the close of the first quarter. Prices are being maintained, and no changes are expected in the immediate future. Industrial demand is somewhat less than toward the close of the last quarter.

No outstanding structural steel award was included in the week's lettings, which totaled but 610 tons. Schrader Iron Works took 150 tons for a school at Richmond, Cal., and a like tonnage went to Western Iron Works for a brewery at San Francisco. Pacific Coast Steel Corp. booked 175 tons of reinforcing bars for a seawall at Fort Lewis, Wash. Santa Cruz, Cal., awarded Pittsburgh-Des Moines Steel Co. 300 tons of plates for tanks.

Among the new projects reported was a viaduct in Seattle, Wash., which will require 900 tons of structural steel and 200 tons of reinforcing steel. Plans for the Gaffey Avenue bridges in Los Angeles call for 400 tons of bars. Minneapolis Bridge Co. is low bidder on a Federal bridge over the Milk River near Wiota, Mont.

Demand Improves in Cincinnati District

CINCINNATI, Jan. 16.—Steady purchasing of pig iron at a rate equal to the weekly average of the past six months has dispelled fears that the heavy shipments during December would stifle business this month. Total bookings, the past week, were about 500 tons in carload lots. Sales representatives of the American Rolling Mill Co. have opened books for the sale of iron from the Columbus furnace, which went into operation last week. Production schedules at Columbus have been set at about 50 per cent of capacity, which makes available about 350 tons of iron a day. Foundry business is spotty. Some foundries have received automotive and Government work and are operating at a fair rate, but in other shops the melt is still low.

Steel

Increased automotive demand has raised the operations of district sheet mills to near 50 per cent of capacity. Miscellaneous business has also improved, giving the entire market a more optimistic tone than was expected at the turn of the year. Lack of consumer resistance to prices is keeping schedules intact, although the opinion is expressed that second quarter quotations will have to be increased to take care of added costs under the codes. The leading interest reports operations on a level with demand, although some of its units are working alternate weeks.

Scrap

With mills carrying substantial inventories of scrap, new purchases are almost nil. Dealers' purchases, for the most part, are being laid down in yards in the hope of further strength in prices. Although the market tone is better, some minor adjustments of bids to lower levels have been made.

Sheet Orders Gain in Cleveland Area



**Motor Car Builders Take More Steel—
Ingot Output Rises to 50 Per Cent—Scrap
Prices Continue to Advance**

CLEVELAND, Jan. 16.—Activity in finished steel the past week was confined largely to orders for sheets, mostly from the automotive industry. New business continues to come from that source in moderate volume in spite of accumulated stocks and delays in getting under good production on new models. Owing to changes in body design it is stated that automobile manufacturers were unable to prepare specifications and stock up in sheets last year to the extent they did in some other steel products. Demand for sheets outside of the motor car industry also shows improvement.

Most consumers of bars, plates and shapes still have good stocks accumulated at the end of the year against old contracts and are not placing new orders. However, demand for bars from small buyers shows a slight gain.

Ingot output in the Cleveland-Lorain territory gained three points this week to 50 per cent of capacity. A local plant that produces sheet bars, evidently benefiting from new sheet orders from automobile builders, put on three open-hearth furnaces, while the Lorain plant took off two. The anticipated lull in the January demand for merchant pig iron has resulted in the banking of one of the Toledo furnaces.

The Van Sweringen railroads have postponed until Jan. 22, the taking of bids for cars at the reported request of some of the car builders for more time to prepare their bids. Consequently these car orders probably will not be placed until around Feb. 1, and the mills will not get the benefit of any of this large plant tonnage until next month. No other railroad inquiries are pending. The Federal building program is at present bringing out no new inquiry for structural steel. However, two break-water projects for Lake Erie ports, requiring 3150 tons of sheet steel piling, are pending.

Scrap prices have advanced further. Other prices are unchanged.

Bars, Plates and Shapes

Demand for bars in small lots has improved slightly. Inquiry has gained for plates of special analysis, largely from the oil refining industry, but de-

mand for common grades is inactive. Very little inquiry is coming out for fabricated steel. Four new Ohio highway bridge projects will take 170 tons. For a Cuyahoga County culvert, Ohio has placed 230 tons of reinforcing bars.

Pig Iron

The market is rather dull, although one local interest sold 2000 tons during the week. Most consumers have good stocks accumulated in December. More active demand is expected by the middle of February. Motor car foundries have increased their melt and are expected to operate at a good rate for some time. The outlook for improvement in the demand from the automotive industry is regarded as promising.

Iron Ore

Shipments of Lake Superior ore from lower Lake ports in December were 82,691 tons as against 28,864 tons during the same month in 1932. Receipts at these ports for the 1933 season were 16,323,050 tons as against 2,707,548 tons in 1932, and shipments were 11,993,278 tons as against 2,507,054 tons in the previous year. The dock balance Jan. 1 was 5,326,674 tons as compared with 5,162,251 tons on Jan. 1, 1933. Receipts at furnaces at Lake Erie ports last year were 4,157,143 tons as against 817,722 tons during the previous year. Receipts during the season at other than Lake Erie ports were 5,084,644 tons. These were: Detroit, 554,375 tons; Indiana Harbor, Ind., 1,031,096 tons; Gary, Ind., 1,369,505 tons; South Chicago, 2,005,798 tons, and Hamilton, Ont., 123,870 tons.

Strip Steel

Strip makers have not yet benefited to the same extent as sheet mills from new orders from the automotive industry. The demand from this source is light, as many consumers are still using up their old stocks. Miscellaneous tonnage also is rather limited.

Sheets

New orders continue to come from the motor car industry but none for round lots. Tonnages now being placed are mostly for February production. The local Fisher Body plant is operating in a limited way in making

Chevrolet body parts but expects to receive orders to speed up production next week. There has been moderate improvement in miscellaneous demand, particularly for enamel sheets for refrigerators, washing machine tubs and advertising signs. The steel barrel industry is busier but is still using up its old stocks. A Cleveland manufacturer has taken orders for 10,000 galvanized barrels for export.

Railroads

Taking of bids for 12,775 cars for the Erie, Chesapeake & Ohio and Nickel Plate railroads has been postponed one week, or until Jan. 22. The Nickel Plate has postponed for two weeks the taking of bids for 20 locomotives. The Erie probably will defer sending out inquiries for its 1934 rail requirements until after its cars are purchased.

Scrap

Prices have again advanced 50c. a ton on steel-making grades and 25c. a ton on blast furnace scrap, and the market is very firm. A Valley district consumer during the week made a purchase of No. 1 heavy melting steel at a reported price of \$13. Other consumer buying is expected shortly. The New York Central Railroad has made a sale of cast iron carwheels at \$11.50 for shipment from an Ohio point on its line.

Boston Scrap Prices More Clearly Defined

BOSTON, Jan. 16.—Although scrap is by no means active, business is increasing and the market is more clearly defined. Some No. 1 heavy melting steel has been sold for \$8 a ton, delivered a Rhode Island point, and two barges are loading here for export via New York. Business in scrap otherwise is very largely for eastern Pennsylvania or Pittsburgh district delivery. The general market for No. 1 steel for Pittsburgh delivery is \$6.50 to \$6.75 a ton on cars shipping point, but comparatively little is coming out at this price level. Current shipments in carlots include bundled skeleton, forge flashings, shafting, wrought pipe, No. 2 steel, breakable cast and engine blocks. Small tonnages of rails for rerolling are selling at \$14 to \$14.50 a ton, delivered eastern Pennsylvania.

Business in pig iron is confined exclusively to carlots, with the aggregate slightly larger than in the previous week, but not in excess of 1000 tons for the past week. New England foundries in general are not doing much, but if tentative business materializes, as anticipated, demand for pig iron should show improvement by the end of this month. The Washburn Wire Co., Phillipsdale, R. I., is operating at 100 per cent of capacity.

Metal Markets React to Stimulating Effect of Dollar Devaluation Proposal

Copper and Lead Firm at 8c. and 4c. Respectively—Spelter Strong at 4.60c.—Sterling Shifts Hamper Tin Trading

NEW YORK, Jan. 16.—Market sentiment was definitely stimulated by the monetary statements emanating from Washington, but definite buying support was insufficient to lift prompt and first quarter electrolytic copper above 8c. a lb., Connecticut valley. Mine producers continue inactive at a 9c. level, and custom smelters are more inclined to ask premiums for second quarter deliveries. Although consumers are more interested in metal, they continue to restrict forward purchases because of the possible stock liquidation restriction that may be incorporated in the code. Seven individual codes have now been filed, causing considerable confusion, and the often-postponed public hearing will probably again be delayed until late February. The projected adoption of a minimum market price of 9c. appar-

ently is still a major point of contention.

Consumers on the Continent and in England are again more inclined to buy, following the extended holiday lull in activity. American interests are disposing of moderate tonnages of bonded metal at a cent price which today averaged about 8.25c. a lb., c.i.f. usual European base ports. Germany is purchasing in increased volume, and several French consumers recently bought American metal in preference to Katanga offerings.

Tin

Consumers are generally well stocked and are unwilling to act on new commitments despite the speculative activity in other metals. Current purchases are limited to resales among dealers and brokers at prices

which range from 52c. to 52.37½c. a lb. During the week London prices advanced about £2, and first call postings today were £227 15s. for spot and £228 2s. 6d. for future standard, and £230 5s. for Straits at Singapore. The stronger London quotations and a weak dollar position served to force spot Straits upward to today's market position of 52.37½c. a lb., New York.

Zinc

Spelter buying was somewhat overdue, and the Administration's intentions to revalue the dollar gave increased activity to the market. Despite the uncertainty prevailing in the Joplin ore district, Prime Western is now much stronger at 4.60c. a lb., New York, and 4.25c., East St. Louis, and there is a general disposition to ask an additional 10 points for second quarter supplies. Bookings last week approximated 2600 tons, mostly at 4.25c., although several small forward tonnages were sold at 4.30c. a lb. December sales of Prime Western totaled 3709 tons at a weighted average price of 4.464c. a lb., East St. Louis, and forward sales during the same month aggregated 4532 tons at 4.462c. Unbalanced Tri-State ore production is adversely affecting the refined metal market, but the present low price for concentrates is discouraging mine operations, and a fair output-demand balance may be established during the next month. Prime and flotation grades are unchanged at \$25 a ton, and production last week exceeded sales by about 3000 tons.

Lead

Influenced by Governmental financial policy, consumers are increasingly active, and leading sellers are currently overselling their equivalent daily ore intakes against previous overaccumulations. The major proportion of commitments specify February delivery, but it is estimated that at least 75 per cent of the requirements of that month remain to be booked. The present price basis of 4c. a lb., New York, and 3.90c., St. Louis, is considered firm, and it is only the unsatisfactory statistical outlook which is preventing the market from becoming more buoyant. Cable manufacturers continue to restrict purchases, but all other major outlets are well represented in the present market activity.

Aluminum

Current business is still spotty and in light volume, but the market tone is considerably stronger as a reflection of the impending demand from automobile manufacturers and the projected Governmental monetary program. Remelt No. 12 alloy is difficult to secure under 12c. a lb., and some interests are asking 25 points more for small lots. The 98 to 99 per cent pure grade continues officially priced at 22.90c. a lb., and new No. 12 is strong at 18.50c. a lb.

The Week's Prices. Cents Per Pound for Early Delivery

| | Jan. 10 | Jan. 11 | Jan. 12 | Jan. 13 | Jan. 15 | Jan. 16 |
|-----------------------------|---------|---------|---------|---------|---------|---------|
| Electrolytic copper, N. Y.* | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 |
| Lake copper, N. Y. | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 |
| Straits tin, Spot, N. Y. | 52.00 | 52.37½ | 52.00 | 53.00 | 52.37½ | 52.37½ |
| Zinc, East St. Louis | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 | 4.25 |
| Zinc, New York | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 |
| Lead, St. Louis | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 | 3.90 |
| Lead, New York | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |

* Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb., delivered; New No. 12, 18.50c. a lb., delivered. Aluminum, remelt No. 12 (alloy), carload lots delivered, 12c. a lb., average for week. Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingots, 36c. a lb., delivered. Antimony, 7.25c. a lb., New York. Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

| | |
|-----------------------------------------------|--------------------|
| Tin, Straits Pig | 54.00c. to 55.00c. |
| Tin, bar | 56.00c. to 57.00c. |
| Copper, Lake | 9.50c. to 10.25c. |
| Copper, electrolytic | 9.25c. to 9.75c. |
| Copper, castings | 9.00c. to 10.00c. |
| *Copper sheets, hot-rolled | 15.00c. |
| *High brass sheets | 13.75c. |
| *Seamless brass tubes | 16.25c. |
| *Seamless copper tubes | 16.25c. |
| *Brass rods | 12.25c. |
| Zinc, slabs | 5.75c. to 6.75c. |
| Zinc sheets (No. 9), casks | 9.75c. to 10.00c. |
| Lead, American pig | 4.75c. to 5.75c. |
| Lead, bar | 5.75c. to 6.75c. |
| Lead, sheets | 7.50c. to 7.75c. |
| Antimony, Asiatic | 8.75c. |
| Alum., virgin, 99 per cent, plus | 23.30c. |
| Alum., No. 1 for remelting, 98 to 99 per cent | 18.00c. to 19.00c. |
| Solder, ½ and ½ | 32.00c. to 33.00c. |
| Babbitt metal, commercial grade | 25.00c. to 60.00c. |

* These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

| | |
|------------------|---------|
| Tin, Straits pig | 56.00c. |
| Tin, bar | 58.00c. |

| | |
|-----------------------------|------------------|
| Copper, Lake | 9.00c. |
| Copper, electrolytic | 9.00c. |
| Copper, castings | 8.75c. |
| Zinc, slab | 5.75c. to 6.00c. |
| Lead, American pig | 5.00c. to 5.25c. |
| Lead, bar | 8.00c. |
| Antimony, Asiatic | 9.00c. |
| Babbitt metal, medium grade | 19.50c. |
| Babbitt metal, high grade | 60.50c. |
| Solder, ½ and ½ | 33.50c. |

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

| | Dealers' Buying Prices | Dealers' Selling Prices |
|-------------------------------------|------------------------|-------------------------|
| Copper, hvy. crucible | 6.00c. | 7.00c. |
| Copper, hvy. and wire | 5.75c. | 6.75c. |
| Copper, light and bottoms | 4.75c. | 5.50c. |
| Brass, heavy | 3.25c. | 3.75c. |
| Brass, light | 2.75c. | 3.25c. |
| Hvy. machine composition | 4.37½c. | 5.12½c. |
| No. 1 yel. brass turnings | 4.12½c. | 4.87½c. |
| No. 1 red brass or compos. turnings | 3.87½c. | 4.62½c. |
| Lead, heavy | 3.00c. | 3.625c. |
| Zinc | 2.50c. | 3.00c. |
| Cast aluminum | 7.25c. | 8.50c. |
| Sheet aluminum | 11.25c. | 12.75c. |

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

| Iron and Steel Bars | |
|--------------------------------|-------|
| Soft Steel Base per Lb. | |
| F.o.b. Pittsburgh mill | 1.75c |
| F.o.b. Chicago or Gary | 1.80c |
| Del'd Philadelphia | 2.04c |
| Del'd New York | 2.08c |
| F.o.b. Cleveland | 1.80c |
| F.o.b. Buffalo | 1.85c |
| F.o.b. Birmingham | 1.90c |
| F.o.b. cars dock Pacific ports | 2.30c |
| F.o.b. cars dock Gulf ports | 2.15c |

| Rail Steel (For merchant trade) | |
|---------------------------------|-------|
| F.o.b. Cleveland | 1.70c |
| F.o.b. Chicago | 1.70c |
| F.o.b. Gary | 1.70c |
| F.o.b. Pittsburgh | 1.75c |
| F.o.b. Buffalo | 1.75c |
| F.o.b. Birmingham | 1.80c |

| Billet Steel Reinforcing | |
|---------------------------------------------------------------------------------------------------------------|-------|
| (Stock lengths as quoted by distributors; cutting to length, 60 in. and over takes extra of 10c. per 100 lb.) | |
| F.o.b. P'gh mills | 1.80c |
| F.o.b. Birmingham | 1.85c |
| F.o.b. Buffalo | 1.85c |
| F.o.b. Cleveland | 1.85c |
| F.o.b. Youngstown | 1.85c |
| F.o.b. cars dock Pacific ports | 2.35c |
| F.o.b. cars dock Gulf ports | 2.20c |
| (Cut lengths as quoted by distributors) | |
| F.o.b. Chicago | 1.95c |

| Rail Steel Reinforcing | |
|-----------------------------------------|-------|
| (Cut lengths as quoted by distributors) | |
| F.o.b. Pittsburgh | 1.75c |
| F.o.b. Cleveland | 1.80c |
| F.o.b. Chicago | 1.80c |

| Iron | |
|---------------------------------------|----------------|
| Common iron, f.o.b. Terre Haute, Ind. | 1.60c to 1.75c |
| Refined iron, f.o.b. P'gh mills | 2.75c |
| Common iron, del'd Philadelphia | 1.89c |
| Common iron, del'd New York | 1.93c |

| Steel Car Axles | |
|-------------------|-------|
| F.o.b. Pittsburgh | 2.50c |
| F.o.b. Chicago | 2.50c |

| Tank Plates | |
|-----------------------------------|-------|
| Base per Lb. | |
| F.o.b. Pittsburgh mill | 1.70c |
| F.o.b. Chicago | 1.75c |
| F.o.b. Birmingham | 1.85c |
| F.o.b. Gary | 1.75c |
| F.o.b. Buffalo | 1.80c |
| F.o.b. Cleveland | 1.85c |
| F.o.b. Coatesville | 1.85c |
| F.o.b. Sparrows Point | 1.80c |
| Del'd New York | 1.98c |
| F.o.b. cars dock Pacific ports | 2.25c |
| F.o.b. cars dock Gulf ports | 2.10c |
| Wrought iron plates, f.o.b. P'gh. | 3.00c |

| Floor Plates | |
|-------------------|-------|
| F.o.b. Pittsburgh | 3.20c |
| F.o.b. Chicago | 3.25c |

| Structural Shapes | |
|----------------------------------------------|---------|
| Base per Lb. | |
| F.o.b. Pittsburgh mill | 1.70c |
| F.o.b. Chicago | 1.75c |
| F.o.b. Birmingham | 1.85c |
| F.o.b. Buffalo | 1.80c |
| F.o.b. Bethlehem | 1.80c |
| Del'd Cleveland | 1.885c |
| Del'd Philadelphia | 1.955c |
| Del'd New York | 1.9525c |
| F.o.b. cars dock, Gulf ports | 2.10c |
| F.o.b. cars dock Pacific ports (standard) | 2.25c |
| F.o.b. cars dock Pacific ports (wide flange) | 2.35c |

| Steel Sheet Piling | |
|--------------------------------|-------|
| Base per Lb. | |
| F.o.b. Pittsburgh | 2.00c |
| F.o.b. Chicago mill | 2.10c |
| F.o.b. Buffalo | 2.10c |
| F.o.b. cars dock Gulf ports | 2.45c |
| F.o.b. cars dock Pacific ports | 2.45c |

| Alloy Steel Bars | |
|------------------------------------------------------------------------------------|--------|
| Open-hearth grade, base, 2.45c a lb. except at Bethlehem where the price is 2.55c. | |
| S.A.E. Alloy Series | |
| Numbers | |
| 2000 (1/4% Nickel) | \$0.25 |
| 2100 (2 1/2% Nickel) | 0.55 |
| 2300 (3 1/2% Nickel) | 1.50 |
| 2500 (5% Nickel) | 2.25 |
| 3100 Nickel Chromium | 0.55 |
| 3200 Nickel Chromium | 1.35 |
| 3300 Nickel Chromium | 3.80 |
| 3400 Nickel Chromium | 3.20 |
| 4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum) | 0.50 |
| 4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 0.70 |
| 4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel) | 1.05 |
| 5100 Chromium Steel (0.60 to 0.90 Chromium) | 0.35 |
| 5100 Chromium Steel (0.80 to 1.10 Chromium) | 0.45 |
| 5100 Chromium Spring Steel | base |
| 6100 Chromium Vanadium Bar | 1.20 |
| 4100 Chromium Vanadium Spring Steel | 0.95 |
| Chromium Nickel Vanadium | 1.50 |
| Carbon Vanadium | 0.95 |

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/5c. per | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extra.

Cold Finished Bars*

| Base per Lb. | |
|--------------------------------------|----------------------------|
| Bars, f.o.b. Pittsburgh mill | 2.10c |
| Bars, f.o.b. Chicago | 2.15c |
| Bars, Cleveland | 2.15c |
| Bars, Buffalo | 2.20c |
| Bars, Detroit | 2.30c |
| Bars, eastern Michigan | 2.35c |
| Precision round bars, Pittsburgh | 2.30c |
| Precision round bars, Cleveland | 2.35c |
| Precision round bars (alloy), Pitts. | 3.00c |
| Shafting, ground, f.o.b. mill | 1 1/4 in. 3.40c |
| | 1-3/16 to 1 1/2 in. 2.90c |
| | 1-9/16 to 1 3/4 in. 2.75c |
| | 1-15/16 to 2 1/4 in. 2.60c |
| | 2-15/16 to 6 in. 2.45c |

* In quantities of 10,000 to 19,000 lb.

SHEETS, STRIP, TIN PLATE

| TERNE PLATE | |
|----------------------------------------|-----------|
| Sheets | |
| Hot Rolled | |
| Base per Lb. | |
| No. 10, f.o.b. Pittsburgh | 1.75c |
| No. 10, f.o.b. Gary | 1.85c |
| No. 10, del'd Phila. | 2.04c |
| No. 10, f.o.b. Birmingham | 1.90c |
| No. 10, f.o.b. cars dock Pacific ports | 2.42 1/2c |

| Hot-Rolled Annealed | |
|----------------------------------------|-------|
| No. 24, f.o.b. Pittsburgh | 2.25c |
| No. 24, f.o.b. Gary | 2.35c |
| No. 24, del'd Phila. | 2.54c |
| No. 24, f.o.b. Birmingham | 2.40c |
| No. 24, f.o.b. cars dock Pacific ports | 2.95c |
| No. 24, wrought iron, Pittsburgh | 4.30c |

| Heavy Cold-Rolled | |
|---------------------------------------------|-------|
| No. 10 gage, f.o.b. Pittsburgh | 2.30c |
| No. 10 gage, f.o.b. Gary | 2.40c |
| No. 10 gage, del'd Phila. | 2.59c |
| No. 10 gage, f.o.b. cars dock Pacific ports | 3.00c |

| Light Cold-Rolled | |
|---------------------------------------------|-------|
| No. 20 gage, f.o.b. Pittsburgh | 2.75c |
| No. 20 gage, f.o.b. Gary | 2.85c |
| No. 20 gage, del'd Phila. | 3.04c |
| No. 20 gage, f.o.b. cars dock Pacific ports | 3.45c |

| Galvanized Sheets | |
|----------------------------------------|-------|
| No. 24, f.o.b. Pittsburgh | 2.85c |
| No. 24, f.o.b. Gary | 2.95c |
| No. 24, del'd Phila. | 3.14c |
| No. 24, f.o.b. Birmingham | 3.00c |
| No. 24, f.o.b. cars dock Pacific ports | 3.55c |
| No. 24 Wrought iron, Pittsburgh | 4.95c |

| Lona Ternes | |
|----------------------------------|-------|
| No. 24, unassorted 8-lb. coating | 3.25c |
| f.o.b. Pittsburgh | 3.25c |

| Vitreous Enameling Stock | |
|---------------------------|-------|
| No. 20, f.o.b. Pittsburgh | 2.90c |

| Tin Mill Black Plate | |
|---------------------------|-------|
| No. 28, f.o.b. Pittsburgh | 2.65c |
| No. 28, Gary | 2.75c |

| Tin Plate | |
|------------------------------------------------|--------|
| Base per Box | |
| Standard cokes, f.o.b. P'gh district mill | \$5.25 |
| Standard cokes, f.o.b. Gary | 5.35 |
| Standard cokes, f.o.b. cars dock Pacific ports | 5.80 |

| Terne Plate | |
|----------------------------|---------|
| (F.o.b. Pittsburgh) | |
| (Per Package, 20 x 28 in.) | |
| 8-lb. coating I.C. | \$10.00 |
| 15-lb. coating I.C. | 12.00 |
| 20-lb. coating I.C. | 13.00 |
| 25-lb. coating I.C. | 14.00 |
| 30-lb. coating I.C. | 15.25 |
| 40-lb. coating I.C. | 17.50 |

| Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in. | |
|---------------------------------------------------------|-------|
| Base per Lb. | |
| All widths up to 24 in., P'gh. | 1.75c |
| All widths up to 24 in., Chicago | 1.85c |
| Cooperage stock, Pittsburgh | 1.85c |
| Cooperage stock, Chicago | 1.95c |

| Cold-Rolled Strips | |
|--------------------|-------|
| F.o.b. Pittsburgh | 2.40c |
| F.o.b. Cleveland | 2.40c |
| Del'd Chicago | 2.68c |
| F.o.b. Worcester | 2.60c |

| Fender Stock | |
|---------------------------------|-------|
| No. 20, Pittsburgh or Cleveland | 3.10c |

| WIRE PRODUCTS | |
|--------------------------------------------------|-------|
| (Carload lots, f.o.b. Pittsburgh and Cleveland.) | |
| To Manufacturing Trade | |
| Per Lb. | |
| Bright wire | 2.20c |
| Spring wire | 3.20c |

| To Jobbing Trade | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Extras of 10c. a 100 lb. on joint carloads and 50c. on pool cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments. | |

| Standard wire nails | |
|---------------------|------|
| Base per 100 Lb. | |
| Smooth coated nails | 2.35 |
| Galvanized nails: | |
| 15 gage and coarser | 4.35 |
| 16 gage and finer | 4.85 |

| Smooth annealed wire | |
|-------------------------------|-------|
| Base per 100 Lb. | |
| Smooth galvanized wire | 2.70 |
| Polished staples | 3.05 |
| Galvanized staples | 3.30 |
| Barbed wire, galvanized | 2.85 |
| Woven wire fence, base column | 60.00 |

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh); and Birmingham mill prices are \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

| Butt Weld | |
|-----------|-------------|
| Steel | |
| Inches | Black Galv. |
| 1/8 | 51 1/2 |
| 1/4 | 57 |
| 3/8 | 62 |
| 1/2 | 65 1/2 |
| 3/4 | 67 1/2 |
| 1 to 3 | 67 1/2 |

| Wrought Iron | |
|--------------|------------------------|
| Inches | Black Galv. |
| 1/8 | 51 1/2 + 1 1/2 + 1 1/2 |
| 1/4 | 57 + 1 1/2 + 1 1/2 |
| 3/8 | 62 + 1 1/2 + 1 1/2 |
| 1/2 | 65 1/2 + 1 1/2 + 1 1/2 |
| 3/4 | 67 1/2 + 1 1/2 + 1 1/2 |
| 1 to 3 | 67 1/2 + 1 1/2 + 1 1/2 |

| Lap Weld | |
|------------|--------|
| 2 | 63 1/2 |
| 2 1/2 to 3 | 66 1/2 |
| 3 1/2 to 6 | 68 1/2 |
| 7 and 8 | 67 1/2 |
| 9 and 10 | 67 1/2 |
| 11 and 12 | 66 |

| Butt Weld, extra strong, plain ends | |
|-------------------------------------|--------|
| 1/8 | 48 1/2 |
| 1/4 | 54 1/2 |
| 3/8 | 60 1/2 |
| 1/2 | 64 1/2 |
| 3/4 | 66 1/2 |
| 1 to 3 | 67 1/2 |

| Lap Weld, extra strong, plain ends | |
|------------------------------------|--------|
| 2 | 61 1/2 |
| 2 1/2 to 3 | 65 1/2 |
| 3 1/2 to 6 | 69 1/2 |
| 7 and 8 | 68 1/2 |
| 9 and 10 | 67 1/2 |
| 11 and 12 | 66 |

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

| Base Discounts, f.o.b. Pittsburgh | |
|-----------------------------------|----|
| Steel | |
| 2 in. and 2 1/2 in. | 33 |
| 3 in. | 33 |
| 3 1/2 in.—2 1/2 in. | 40 |
| 4 in. | 44 |
| 4 1/2 in.—3 1/2 in. | 47 |
| 5 in. | 49 |
| 4 1/2 in. to 6 in. | 42 |

| Charcoal Iron | |
|---------------------|----|
| 1 1/2 in.—1 1/4 in. | 44 |
| 2 in.—2 1/2 in. | 13 |
| 2 1/2 in.—2 1/2 in. | 16 |
| 3 in. | 17 |
| 3 1/2 in.—3 1/2 in. | 17 |
| 4 in. | 18 |
| 4 1/2 in. | 20 |
| 4 1/2 in. | 21 |

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five. Exception: On 1 1/2 to 1 3/4-in. charcoal iron tubes no supplementary discounts are granted, and the discount for 10,000 lb. to a carload is 4 points under base and for less than 10,000 lb. 8 points under base.

Standard Commercial Seamless Boiler Tubes

| Cold-Drawn | |
|--------------------|----|
| 1 in. | 68 |
| 1 1/4 to 1 1/2 in. | 68 |
| 1 3/4 in. | 68 |
| 2 to 2 1/2 in. | 27 |
| 2 1/2 to 3 in. | 34 |

| Hot-Rolled | |
|--------------------|----|
| 2 and 2 1/2 in. | 33 |
| 2 1/2 and 3 in. | 40 |
| 3 in. | 44 |
| 3 1/2 in. | 47 |
| 4 in. | 49 |
| 4 1/2, 5 and 6 in. | 36 |

In the case of all sizes except 1-in. to 1 3/4-in. cold-drawn boiler tubes supplementary discounts of two 5 per cents are allowed on carload lots. On quantities up to 10,000 lb. the base discount is reduced 10 points and a supplementary discount of 5 per cent only is allowed. On quantities 10,000 lb. to 24,999 lb. the base discount is reduced 6 points and a supplementary discount of 5 per cent only is allowed. On 25,000 lb. to a carload the base discount is reduced 2 points and supplementary discounts of two 5 per cents are allowed.

On 1 to 1 3/4-in. cold-drawn boiler tubes, there are no supplementary discounts. On quantities up to 10,000 lb. the base discount is reduced 12 points; on 10,000 lb. to 24,999 lb., it is reduced 8 points; on 25,000 lb. to a carload it is reduced 2 points.

Seamless Mechanical Tubing

Carbon, 0.10% to 0.30% base (carloads) 55
Carbon, 3.30% to 40% base..... 50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

| F.o.b. Mill | |
|-------------------------------------|-------------|
| Standard rails, 60-lb. and heavier, | |
| per gross ton | \$36.37 1/2 |
| Angle bars, per 100 lb. | 2.55 |

F.o.b. Code Basing Points

| | |
|---------------------------------------------|---------|
| Light rails (from billets) per gross ton | \$32.00 |
| Light rails (from rail steel) per gross ton | 31.00 |

| Base per 100 Lb. | |
|----------------------------------------------------|-----------------------|
| Spikes, 9/16 in. and larger | \$2.40 |
| Spikes, 1/2 in. and smaller | 2.40 |
| Spikes, boat and barge | 2.40 |
| Tie plates, steel, 1, 2, 3 and 7 heads | 1.90 |
| Track bolts, to steam railroads | 3.55 |
| Track bolts, to jobbers, all sizes (per 100 count) | .70 per cent off list |

BOLTS, NUTS, RIVETS AND SET SCREWS

Boils and Nuts

| F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago | |
|-----------------------------------------------------|---------------|
| Per Cent Off List | |
| Machine bolts | 70 |
| Carriage bolts | 70 |
| Lag bolts | 70 |
| Plow bolts, Nos. 1, 2, 3 and 7 heads | 70 |
| Hot-pressed nuts, blank or tapped, square | 70 |
| Hot-pressed nuts, blank or tapped, hexagons | 70 |
| C.p.c. and t. square or hex. nuts, blank or tapped | 70 |
| Semi-finished hexagon nuts | 70 |
| Semi-finished hexagon castellated nuts, S.A.E. | 70 |
| Stove bolts in packages, P'gh. | 70, 25 and 10 |
| Stove bolts in packages, Chgo. | 70, 25 and 10 |
| Stove bolts in packages, Cleveland | 70, 25 and 10 |
| Stove bolts in bulk, P'gh. | 83 |
| Stove bolts in bulk, Chicago | 83 |
| Stove bolts in bulk, Cleveland | 83 |
| Tire bolts | 60 |

Large Rivets

| Base per 100 Lb. | |
|--------------------------------|--------|
| F.o.b. Pittsburgh or Cleveland | \$2.75 |
| F.o.b. Chicago and Birmingham | 2.85 |

Small Rivets

| Base per 100 Lb. | |
|-----------------------------|-----------|
| F.o.b. Pittsburgh | 70 and 10 |
| F.o.b. Cleveland | 70 and 10 |
| F.o.b. Chicago and Birm'g'm | 70 and 10 |

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 180 lb. on lots of 200 lb. or more)

| Per Cent Off List | |
|-------------------------------------------------------------------------------|---------------|
| Milled cap screw, 1 in. dia. and smaller | 75, 10 and 10 |
| Milled standard set screws, case hardened, 1 in. dia. and smaller, .75 and 10 | |
| Milled headless set screws, cut thread 1/4 in. and smaller | 75 |
| Upset hex. head cap screw, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller | 85 |
| Upset set screws cut and oval point | 75 and 10 |
| Milled studs | .65 and 5 |

STAINLESS STE

Wire Rods (Common soft, base)

| | Per Gross Ton |
|--------------------|---------------|
| Pittsburgh | \$38.00 |
| Cleveland | 36.00 |
| Chicago | 37.00 |
| Birmingham | 39.00 |
| Youngstown (del'd) | 37.00 |

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.
Base price, \$49 a gross ton except at Bethlehem, where it is \$51.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago.
Uncropped, \$28 per gross ton.

COKE, COAL AND FUEL OIL

| | Per Net Ton |
|--------------------------------|----------------|
| Furnace, f.o.b. Connellsville | \$3.50 |
| Prompt | |
| Foundry, f.o.b. Connellsville | \$4.25 to 5.25 |
| Prompt | |
| Foundry, by-product, Chicago | |
| ovens, for delivery outside | |
| switching district | 8.50 |
| Foundry, by-product, delivered | |
| in Chicago switching | |
| district | 9.25 |
| Foundry, by-product, New | |
| England, delivered | 10.50 |
| Foundry, by-product, Newark | |
| or Jersey City, del'd | 8.20 to 8.81 |
| Foundry, by-product, Phila. | |
| land delivered | 9.00 |
| Foundry, by-product, Cleve- | |
| land delivered | 9.27 |
| Foundry, by-product, St. | |
| Louis, f.o.b. ovens | 8.00 |
| Foundry, by-product, del'd | |
| St. Louis | 9.00 |

| | Per Net Ton |
|-------------------------------|------------------|
| Mine run steam coal, f.o.b. | |
| W. Pa. mines | \$1.55 to \$1.80 |
| Mine run coking coal f.o.b. | |
| W. Pa. mines | 1.80 to 2.00 |
| Gas coal, 1/2-in., f.o.b. Pa. | |
| mines | 2.00 to 2.30 |
| Mine run gas coal, f.o.b. Pa. | |
| mines | 1.80 to 2.20 |
| Steam slack, f.o.b. W. Pa. | |
| mines | 1.30 to 1.40 |
| Gas slack, f.o.b. W. Pa. | |
| mines | 1.65 to 1.85 |

Fuel Oil

| | Per Gal. f.o.b. Bayonne, N. J. |
|---------------------------|--------------------------------|
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |
| | Per Gal. f.o.b. Baltimore |
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |
| | Per Gal. del'd Chicago |
| No. 3 industrial fuel oil | 3.75c. |
| No. 5 industrial fuel oil | 3.00c. |
| | Per Gal. f.o.b. Cleveland |
| No. 3 distillate | 5.75c. |
| No. 4 industrial | 5.50c. |

REFRACTORIES

Fire Clay Brick

| | Per 1000 f.o.b. Works |
|------------------------|-----------------------|
| High-heat Intermediate | |
| Duty Brick | Duty Brick |
| Pennsylvania | \$45.00 |
| Maryland | 45.00 |
| New Jersey | 45.00 |
| Ohio | 45.00 |
| Kentucky | 45.00 |
| Missouri | 45.00 |
| Illinois | 45.00 |
| Ground fire clay, per | |
| ton | 7.00 |

Chrome Brick

| | Per Net Ton |
|---------------|-------------|
| Standard size | \$45.00 |

Silica Brick

| | Per 1000 f.o.b. Works |
|----------------------|-----------------------|
| Pennsylvania | \$45.00 |
| Chicago | 54.00 |
| Birmingham | 55.00 |
| Silica clay, per ton | 8.00 |

Magnesite Brick

| | Per Net Ton |
|---------------------------------------|-------------|
| Standard sizes, burned, f.o.b. Balti- | |
| more and Chester, Pa. | \$65.00 |
| Unburned, f.o.b. Baltimore | 55.00 |
| Grain magnesite, f.o.b. Baltimore | |
| and Chester, Pa. | 40.00 |
| Domestic, f.o.b. Chewelah, Wash. | 22.00 |

CAST IRON PIPE

| | Per Net Ton |
|------------------------------------|--------------------|
| 6-in. and larger, del'd | |
| Chicago | \$44.00 to \$45.00 |
| 4-in., del'd Chicago | 47.00 to 48.00 |
| 6-in. and larger, del'd New York | 43.00 |
| 4-in., del'd New York | 46.00 |
| 6-in., and larger, Birmingham | |
| | 30.00 to 37.00 |
| 4-in. Birmingham | 39.00 to 40.00 |
| Class "A" and gas pipe, \$3 extra. | |

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

| Basing Points | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---------------------|-------------|-----------|---------|----------|
| Everett, Mass. | \$18.50 | \$19.00 | \$18.00 | \$19.50 |
| Bethlehem, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Birdsboro, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Swedeland, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Sparrows Point, Md. | 18.50 | 19.00 | 18.00 | 19.50 |
| Neville Island, Pa. | 18.00 | 18.00 | 17.50 | 18.50 |
| Sharpville, Pa. | 17.50 | 17.50 | 17.00 | 18.00 |
| Youngstown | 17.50 | 17.50 | 17.00 | 18.00 |
| Buffalo | 17.50 | 18.00 | 16.50 | 18.50 |
| Erie, Pa. | 17.50 | 18.00 | 17.00 | 18.50 |
| Cleveland | 17.50 | 17.50 | 17.00 | 18.00 |
| Toledo, Ohio | 17.50 | 17.50 | 17.00 | 18.00 |
| Detroit | 17.50 | 17.50 | 17.00 | 18.00 |
| Hamilton, Ohio | 17.50 | 17.50 | 17.00 | 18.00 |
| Chicago | 17.50 | 17.50 | 17.00 | 18.00 |
| Granite City, Ill. | 17.50 | 18.00 | 17.00 | 18.50 |
| Duluth, Minn. | 18.00 | 18.00 | 17.00 | 18.50 |
| Birmingham | 13.50 | 12.50 | 12.50 | 13.50 |
| Provo, Utah | 18.50 | 18.50 | 18.50 | 18.50 |

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|-------------------------------|-------------|-----------|---------|----------|
| Boston Switching District | | | | |
| From Everett, Mass. | \$19.00 | \$19.50 | \$18.50 | \$20.00 |
| From Buffalo | 19.00 | 19.50 | 18.50 | 20.00 |
| Brooklyn | | | | |
| From East. Pa. or Buffalo | 20.77 | 21.27 | 20.27 | 21.77 |
| Newark or Jersey City, N. J. | 19.89 | 20.39 | 19.39 | 20.89 |
| From East. Pa. or Buffalo | 19.89 | 20.39 | 19.39 | 20.89 |
| Philadelphia | | | | |
| From Eastern Pa. | 19.26 | 19.76 | 18.76 | 20.26 |
| Cincinnati | | | | |
| From Hamilton, Ohio | 18.51 | 18.51 | 18.01 | 19.01 |
| Canton, Ohio | | | | |
| From Cleveland and Youngstown | 18.76 | 18.76 | 18.76 | 18.76 |
| Columbus, Ohio | | | | |
| From Hamilton, Ohio | 19.50 | 19.50 | 19.50 | 19.50 |
| Mansfield, Ohio | | | | |
| From Cleveland and Toledo | 19.26 | 19.26 | 19.26 | 19.26 |
| Indianapolis | | | | |
| From Hamilton, Ohio | 19.77 | 19.77 | 19.77 | 19.77 |
| South Bend, Ind. | | | | |
| From Chicago | 19.55 | 19.55 | 19.55 | 19.55 |
| Milwaukee | | | | |
| From Chicago | 18.50 | 18.50 | 18.50 | 18.50 |
| St. Paul | | | | |
| From Duluth | 19.44 | 19.44 | 19.44 | 19.44 |
| Davenport, Iowa | | | | |
| From Chicago | 19.26 | 19.26 | 19.26 | 19.26 |
| Kansas City | | | | |
| From Granite City | 20.04 | 20.54 | 20.54 | 20.54 |

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

| | |
|---------------------------------------|---------|
| Basing points: Birdsboro, Pa., Steel- | |
| ton, Pa. and Standish, N. Y. | \$23.00 |
| Johnson City, Tenn. | 23.00 |
| Del'd Chicago | 28.65 |

GRAY FORGE PIG IRON

| | |
|----------------|---------|
| Valley furnace | \$17.50 |
|----------------|---------|

CHARCOAL PIG IRON

| | |
|-----------------------|---------|
| Lake Superior furnace | \$20.50 |
| Delivered Chicago | 23.54 |
| Delivered Buffalo | 23.78 |

CANADA

Pig Iron

| | |
|-------------------------------|---------|
| Per gross ton: | |
| Delivered Toronto | |
| No. 1 fdy., sil. 2.25 to 2.75 | \$31.00 |
| No. 2 fdy., sil. 1.75 to 2.75 | 20.50 |
| Malleable | 21.00 |
| Delivered Montreal | |
| No. 1 fdy., sil. 2.25 to 2.75 | \$22.50 |
| No. 2 fdy., sil. 1.75 to 2.25 | 22.50 |
| Malleable | 22.50 |
| Basic | 22.00 |

Ferromanganese

| | Per Gross Ton |
|--------------------------|---------------|
| Domestic, 80%, seaboard, | |
| (carload) | \$85.00 |
| Domestic, 80%, seaboard, | |
| (ton lots) | 92.00 |

Spiegeleisen

| | Per Gross Ton Furnace |
|---------------------|-----------------------|
| Domestic, 19 to 21% | \$27.00 |

Electric Ferrosilicon

| | Per Gross Ton Delivered |
|--------------------------------|-------------------------|
| 50% (carloads) | \$77.50 |
| 50% (ton lots) | 85.00 |
| 75% (carloads) | 126.00 |
| 75% (ton lots) | 136.00 |
| 14% to 16% (f.o.b.) Welland | 33.75 |
| Ont. (in carloads) (duty paid) | 31.00 |
| 14% to 16% (less carloads) | 38.50 |

Silvery Iron

| | F.o.b. Jackson, Ohio, Furnace |
|---------------|-------------------------------|
| Per Gross Ton | |
| 6% | \$22.25 |
| 7% | 23.25 |
| 8% | 24.25 |
| 9% | 25.25 |
| 10% | 26.25 |
| 11% | 27.75 |
| 12% | \$29.25 |
| 13% | 30.75 |
| 14% | 32.25 |
| 15% | 33.75 |
| 16% | 35.25 |
| 17% | 36.75 |

| | |
|---------------------------------------|------------------|
| Ferrovandium, del., per | |
| lb. contained V. | \$2.70 to \$2.90 |
| Ferrocobaltititanium, 15 to 18% | |
| Ti. 6 to 8% C, f.o.b. furnace, | |
| carload and contract for net ton | \$137.50 |
| Ferrophosphorus, electric, or blast | |
| furnace material, in carloads, | |
| 18%, Rockdale, Tenn., base, per | |
| gross ton with \$2 unitage | 50.00 |
| Ferrophosphorus, electric, 24% f.o.b. | |
| Anniston, Ala., per gross ton with | |
| \$2.75 unitage | 65.00 |
| Ferromolybdenum, per lb. Mo., del. | |
| 95c. | |
| Calcium molybdate, per lb. Mo., | |
| del. | 80c. |
| Silico spiegel, per ton, f.o.b. fur- | |
| nace, car lots | \$38.00 |
| Ton lots or less, per ton | 45.50 |
| Silico-manganese, gross ton, deliv- | |
| ered: | |
| 2.50% carbon grade | 90.00 |
| 2% carbon grade | 85.00 |
| 1% carbon grade | 105.00 |
| Spot prices | \$5 a ton higher |

Ores

Lake Superior Ores, Delivered Lamer Lake Ports

| | Per Gross Ton |
|--------------------------------------|---------------|
| Old range, Bessemer, 51.5% iron | \$4.80 |
| Old range, non-Bessemer, 51.50% iron | 4.65 |
| Mesabi Bessemer, 51.50% iron | 4.65 |
| Mesabi, non-Bessemer, 51.50% iron | 4.50 |
| High phosphorus, 51.50% iron | 4.40 |

Foreign Ore, c.i.f. Philadelphia or Baltimore

| | Per Unit |
|-----------------------------------|----------|
| Iron, low phos., copper free, 55 | |
| to 58% iron, dry Spanish or | |
| Algerian | 9.50c. |
| Iron, low phos., Swedish, average | |
| 68% iron | 9.50c. |
| Iron, basic or foundry, Swedish, | |
| average, 65% iron | 9c. |
| Iron, basic or foundry, Russian, | |
| aver. 65% iron | 9c. |
| Manganese, Caucasian, washed 52% | 22c. |
| Manganese, African, Indian, 44- | |
| 48% | 21c. |
| Manganese, African, Indian, 49- | |
| 51% | 24c. |
| Manganese, Brazilian, 46 to 48% | 20c. |

Per Net Ton Unit

| | |
|------------------------------------|--------------------|
| Tungsten, Chinese wolframite, duty | |
| paid | \$15.00 |
| Tungsten, domestic scheelite | |
| | \$14.50 to \$15.00 |

Per Gross Ton

| | |
|-------------------------------------------------------------|---------|
| Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. | |
| Atlantic Seaboard | \$17.00 |
| Chrome, 48%, Cr ₂ O ₃ , c.i.f. At- | |
| lantic Seaboard | 20.00 |

*Quotations nominal in absence of sales.

Fluorspar

| | Per Net Ton |
|--------------------------------------|-------------|
| Domestic, washed gravel, 85-5 f.o.b. | |
| Kentucky and Illinois mines | \$15.00 |
| No. 2 lump, 85-5, f.o.b. Kentucky | |
| and Illinois mines | 16.00 |
| Foreign, 85% calcium fluoride, not | |
| over 5% silicon, c.i.f. Atlantic | |
| port, duty paid | 18.50 |
| Domestic, No. 1 ground bulk, 85 to | |
| 98% calcium fluoride, not over | |
| 2 1/2% silicon, f.o.b. Illinois and | |
| Kentucky mines | 30.00 |

Iron and Steel Scrap

PITTSBURGH

| | |
|-------------------------------------------|--------------------|
| Per gross ton delivered consumers' yards: | |
| No. 1 heavy melting steel | \$13.00 to \$13.50 |
| No. 2 heavy melting steel | 11.00 to 11.50 |
| No. 2 railroad wrought | 13.00 to 13.50 |
| Scrap rails | 13.00 to 13.50 |
| Rails 8 ft. and under | 14.00 to 14.50 |
| Sheet car crops, ordinary | 13.00 to 13.50 |
| Compressed sheet steel | 11.75 to 12.25 |
| Hand bundled sheet steel | 10.25 to 10.75 |
| Hvy. steel axle turnings | 10.25 to 10.75 |
| Machine shop turnings | 8.75 to 9.25 |
| Short shov. steel turnings | 8.75 to 9.25 |
| Short mixed borings and | |
| turnings | 7.50 to 8.00 |
| Cast iron borings | 7.50 to 8.00 |
| Cast iron carwheels | 11.00 to 11.50 |
| Heavy breakable cast | 11.25 to 11.75 |
| No. 1 cast | 11.50 to 12.00 |
| Rail. knuckles and coup- | |
| lers | 15.00 to 15.50 |
| Rail. coil and leaf springs | 15.00 to 15.50 |
| Roller steel wheels | 15.00 to 15.50 |
| Low phos. billet crops | 16.00 to 16.50 |
| Low phos. sheet bar crops | 14.50 to 15.00 |
| Low phos. plate scrap | 14.00 to 14.50 |
| Low phos. punchings | 14.50 to 15.00 |
| Steel car axles | 13.50 to 14.50 |

CHICAGO

| | |
|---------------------------------------|--------------------|
| Delivered Chicago district consumers: | |
| Per Gross Ton | |
| Heavy melting steel | \$10.25 to \$10.75 |
| Shovelling steel | 10.25 to 10.75 |

| | |
|---------------------------------------|------------------|
| Hydraulic comp. sheets | \$9.00 to \$9.50 |
| Drop forge flashings | 8.50 to 9.00 |
| No. 1 busheling | 8.75 to 9.25 |
| Roller carwheels | 11.00 to 11.50 |
| Railroad tires | 11.50 to 12.00 |
| Railroad leaf springs | 11.00 to 11.50 |
| Axle turnings | 8.50 to 9.00 |
| Steel couplers and knuckles | 11.00 to 11.50 |
| Coil springs | 12.00 to 12.50 |
| Axle turnings (elec. fur.) | 9.25 to 9.75 |
| Low phos. punchings | 12.50 to 13.00 |
| Low phos. plates, 12 in. | |
| and under | 12.50 to 13.00 |
| Cast iron borings | 6.50 to 7.00 |
| Short shovelling turnings | 6.25 to 6.75 |
| Machine shop turnings | 5.50 to 6.00 |
| Rerolling rails | 11.50 to 12.00 |
| Steel rails, less than 3 ft. 12.00 to | |
| 12.50 | |
| Steel rails, less than 2 ft. 12.00 to | |
| 13.00 | |
| Angle bars, steel | 11.50 to 12.00 |
| Cast iron carwheels | 11.00 to 11.50 |
| Railroad malleable | 11.00 to 11.50 |
| Agricultural malleable | 9.00 to 9.50 |

Per Net Ton

| | |
|------------------------|--------------------|
| Iron car axles | \$11.50 to \$12.00 |
| Steel car axles | 11.50 to 12.00 |
| No. 1 railroad wrought | 9.00 to 9.50 |
| No. 2 railroad wrought | 9.00 to 9.50 |

| | |
|--------------------------|------------------|
| No. 2 busheling | \$4.00 to \$4.50 |
| Locomotive tires, smooth | 9.00 to 9.50 |
| Pipe and flues | 5.25 to 5.75 |
| No. 1 machinery cast | 9.50 to 10.00 |
| Clean automobile cast | 9.00 to 9.50 |
| No. 1 railroad cast | 9.00 to 9.50 |
| No. 1 agricultural cast | 8.00 to 8.50 |
| Store plate | 7.00 to 7.50 |
| Grate bars | 6.50 to 7.00 |
| Brake shoes | 8.50 to 9.00 |

PHILADELPHIA

| | |
|-------------------------------------------|--------------------|
| Per gross ton delivered consumers' yards: | |
| No. 1 heavy melting steel | \$11.50 to \$12.00 |
| No. 2 heavy melting steel | 9.50 |
| No. 1 railroad wrought | 11.00 |
| Bundled sheets | 9.50 |
| Hydraulic compressed, new | 9.50 to 10.00 |
| Hydraulic compressed, old | 7.00 to 7.50 |
| Machine shop turnings | 7.50 |
| Heavy axle turnings | 10.00 |
| Cast borings | 5.50 to 6.00 |
| Heavy breakable cast | 11.00 to 11.50 |
| Store plate (steel works) | 9.50 |
| No. 1 low phos. heavy | 14.50 to 15.00 |
| Couplers and knuckles | 14.00 to 14.50 |
| Roller steel wheels | 14.00 to 14.50 |
| No. 1 blast furnace | 5.50 to 6.00 |
| Spec. iron and steel pipe | 9.50 to 10.00 |
| Shafting | 15.00 |
| Steel axles | 14.50 |
| No. 1 forge fire | 10.00 |
| Cast iron car wheels | 11.50 to 12.00 |
| No. 1 cast | 12.00 to 13.00 |
| Cast borings (chem.) | 12.00 to 14.00 |
| Steel rails for rolling | 13.00 |

CLEVELAND

| | |
|-------------------------------------------|--------------------|
| Per gross ton delivered consumers' yards: | |
| No. 1 heavy melting steel | \$10.00 to \$10.50 |
| No. 2 heavy melting steel | 9.00 to 9.50 |
| Compressed sheet steel | 9.50 to 10.00 |
| Light bundled sheet stampings | 6.50 to 7.00 |
| Drop forge flashings | 9.00 to 9.50 |
| Machine shop turnings | 8.00 to 8.50 |
| Short shoveling turnings | 8.00 to 8.50 |
| No. 1 busheling | 9.50 to 10.00 |
| Steel axle turnings | 8.50 to 9.00 |
| Low phos. billet crops | 12.50 to 13.00 |
| Cast iron borings | 8.00 to 8.50 |
| Mixed borings and short turnings | 8.00 to 8.50 |
| No. 2 busheling | 8.00 to 8.50 |
| No. 1 cast | 10.50 to 11.00 |
| Railroad grate bars | 6.50 to 7.00 |
| Store plate | 7.50 to 8.00 |
| Rails under 20 | 14.00 to 15.00 |
| Rails for rolling | 10.50 to 11.00 |
| Railroad malleable | 11.75 to 12.00 |
| Cast iron carwheels | 11.00 |

BUFFALO

| | |
|--------------------------------------------------|--------------------|
| Per gross ton, f.o.b. Buffalo consumers' plants: | |
| No. 1 heavy melting steel | \$10.50 to \$11.00 |
| No. 2 heavy melting scrap | 9.50 to 10.00 |
| Scrap rails | 9.50 to 10.00 |
| New hydraulic comp. sheets | 9.50 to 10.00 |
| Old hydraulic comp. sheets | 8.50 to 9.00 |
| Drop forge flashings | 9.50 to 10.00 |
| No. 1 busheling | 11.00 to 12.00 |
| Hvy. steel axle turnings | 8.50 to 9.00 |
| Machine shop turnings | 7.00 to 7.50 |
| Knuckles and couplers | 12.00 to 12.50 |
| Coil and leaf springs | 12.00 to 12.50 |
| Roller steel wheels | 12.00 to 12.50 |
| Low phos. billet crops | 13.50 to 14.00 |
| Short shov. steel turnings | 7.50 to 8.00 |
| Short mixed borings and turnings | 7.50 to 8.00 |
| Cast iron borings | 7.00 to 7.50 |
| No. 2 busheling | 6.50 to 7.00 |
| Steel car axles | 12.00 to 12.50 |
| Iron axles | 11.00 to 12.00 |
| No. 1 machinery cast | 12.00 to 12.50 |
| No. 1 cupola cast | 10.50 to 11.00 |
| Store plate | 9.25 to 9.75 |
| Steel rails, 3 ft. and under | 12.00 to 12.50 |
| Cast iron carwheels | 11.00 to 11.50 |
| Industrial malleable | 11.50 to 12.00 |
| Railroad malleable | 11.50 to 12.00 |
| Chemical borings | 9.00 to 10.00 |

BIRMINGHAM

| | |
|-------------------------------------------|----------------|
| Per gross ton delivered consumers' yards: | |
| Heavy melting steel | \$10.00 |
| Scrap steel rollings | 9.00 |
| Short shoveling turnings | 5.50 |
| Store plate | 7.50 to 8.00 |
| Steel axles | 11.00 to 11.50 |
| Iron axles | 11.00 to 11.50 |
| No. 1 railroad wrought | 7.00 |
| Rails for rolling | 10.50 |
| No. 1 cast | 9.00 to 9.50 |
| Tramcar wheels | 9.00 to 9.50 |
| Cast iron borings, chem. | 8.00 |

ST. LOUIS

| | |
|-------------------------------------------|--------------------|
| Per gross ton delivered consumers' yards: | |
| Selected heavy steel | \$10.00 to \$10.50 |
| No. 1 heavy melting | 9.00 to 9.50 |
| No. 2 heavy melting | 8.50 to 9.00 |
| No. 1 locomotive tires | 8.00 to 8.50 |
| Misc. stand.-sec. rails | 10.50 to 11.00 |
| Railroad springs | 11.50 to 12.00 |
| Bundled sheets | 6.00 to 6.50 |
| No. 2 railroad wrought | 9.00 to 9.50 |
| No. 1 busheling | 6.50 to 7.00 |
| Cast iron borings and shoveling turnings | 4.50 to 5.00 |
| Rails for rolling | 11.00 to 11.50 |
| Machine shop turnings | 4.25 to 4.75 |
| Heavy turnings | 5.50 to 6.00 |
| Steel car axles | 10.75 to 11.25 |
| Iron car axles | 12.50 to 13.00 |
| Wrot. iron bars and trans. | 9.75 to 10.25 |
| No. 1 railroad wrought | 6.25 to 6.75 |
| Steel rails less than 3 ft. | 12.00 to 12.50 |
| Steel angle bars | 11.50 to 12.00 |
| Cast iron carwheels | 8.25 to 8.75 |
| No. 1 machinery cast | 8.50 to 9.00 |
| Railroad malleable | 8.75 to 9.25 |
| No. 1 railroad cast | 8.00 to 8.50 |
| Store plate | 6.50 to 7.00 |
| Relay rails, 60 lb. and under | 16.00 to 16.50 |

| | |
|-------------------------------|--------------------|
| Relay, rails, 60 lb. and over | \$20.00 to \$21.00 |
| Agricult. malleable | 9.00 to 9.50 |

BOSTON

| | |
|-------------------------------------------|--------------------|
| Dealers' buying prices per gross ton: | |
| No. 1 heavy melting steel | \$6.50 to \$6.75 |
| Scrap T rails | 6.50 to 6.75 |
| Machine shop turnings | 3.00 to 3.25 |
| Cast iron borings | 4.00 to 4.25 |
| Bundled skeleton, long | 5.00 to 5.50 |
| Forge flashings | 5.00 to 5.50 |
| Blast furnace scrap | 4.75 to 5.00 |
| Shafting | 10.25 to 10.50 |
| Steel car axles | 9.75 to 10.25 |
| Wrought pipe | 4.50 to 4.75 |
| Rails for rolling | 14.00 to 14.50 |
| Cast iron borings, chemical | 7.50 to 8.00 |
| Per gross ton delivered consumers' yards: | |
| Textile cast | \$10.00 to \$10.50 |
| No. 1 machinery cast | 10.00 to 10.50 |
| Store plate | 4.50 to 4.75 |
| No. 1 machinery malleable | 1.00 to 1.50 |
| *Delivered Eastern Pennsylvania points. | |

NEW YORK

| | |
|---------------------------------------|------------------|
| Dealers' buying prices per gross ton: | |
| No. 1 heavy melting steel | \$7.75 to \$8.00 |
| No. 2 heavy melting steel | 6.50 to 7.00 |
| Heavy breakable cast | 7.50 to 8.00 |
| No. 1 machinery cast | 8.00 to 8.50 |
| No. 2 cast | 6.50 to 7.00 |
| Store plate | 5.00 to 5.50 |
| Steel car axles | 10.50 to 10.75 |
| No. 1 railroad wrought | 7.50 to 8.00 |

PITTSBURGH

| | |
|---------------------------------------------------------------------------------------------------------------------------------|--------|
| Base per Lb. | |
| Plates | 3.05c. |
| Structural shapes | 3.05c. |
| Soft steel bars and small shapes | 2.85c. |
| Reinforcing steel bars | 3.00c. |
| Cold-finished and screw stock— | |
| Rounds and hexagons | 3.20c. |
| Squares and flats | 3.20c. |
| Hoops and bands, under 1/4 in. | 3.10c. |
| Hot-rolled annealed sheets (No. 24), 25 or more bundles | 3.15c. |
| Galv. sheets (No. 24), 25 or more bundles | 3.70c. |
| Hot-rolled sheets (No. 10) | 2.85c. |
| Galv. corrug. sheets (No. 28), per square (more than 3750 lb.) | \$3.32 |
| Spikes, large | 2.00c. |
| Small | 2.65c. |
| Bolts | 2.90c. |
| Track bolts, all sizes, per 100 count, 65 per cent off list. | |
| Machine bolts, 100 count, 65 per cent off list. | |
| Carriage bolts, 100 count, 65 per cent off list. | |
| Nuts, all styles, 100 count, 65 per cent off list. | |
| Large rivets, base per 100 lb. | |
| Wire, black, soft ann'd, base per 100 lb. | 2.90 |
| Wire, galv. soft, base per 100 lb. | 3.35 |
| Common wire nails, per keg | 2.50 |
| Cement coated nails, per keg | 2.65 |
| On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb. | |

CHICAGO

| | |
|-------------------------------------------|-----------------|
| Base per Lb. | |
| Plates and structural shapes | 3.10c. |
| Soft steel bars | 2.90c. |
| Cold-fn. steel bars and shafting | |
| Rounds and hexagons | 3.40c. |
| Flats and squares | 3.40c. |
| Bands, 3/16 in. (in Nos. 10 and 12 gages) | 3.20c. |
| Hoops (No. 14 gage and lighter) | 3.20c. |
| Hot-rolled annealed sheets (No. 24) | 3.70c. |
| Galv. sheets (No. 24) | 4.30c. |
| Hot-rolled sheets (No. 10) | 2.85c. |
| Spikes (9/16 in. and lighter) | 3.50c. |
| Track bolts | 4.65c. |
| Rivets, structural (keg lots) | 3.10c. |
| Rivets, boiler (keg lots) | 3.10c. |
| Per Cent Off List | |
| Machine bolts | 60 and 5 |
| Carriage bolts | 60 and 5 |
| Coach and lag screws | 60 and 5 |
| Hot-pressed nuts, sq., tap. or blank | 60 and 5 |
| Hot-pressed nuts, hex., tap. or blank | 60 and 5 |
| Hex. head and cap screws | 80 |
| Cup point set screws | 70 |
| Long term sheet screws | 37 1/2 and 10 |
| Spring cotters | 50 |
| Store bolts in full packages | 72 1/2 |
| Rd. hd. tank rivets, 7/16 in. and smaller | 65 |
| Wrought washers | \$5.50 off list |
| No. 8 black ann'd wire per 100 lb. | \$3.75 |
| Comm. wire nails, base per keg | 2.70c. |
| Cement c'd nails, base per keg | 2.70c. |

NEW YORK

| | |
|-----------------------------------------|----------------|
| Base per Lb. | |
| Plates | 3.30c. |
| Structural shapes | 3.27c. |
| Soft steel bars | 3.17c. |
| Iron bars | 3.24c. |
| Iron bars, swed. charcoal | 6.50 to 7.00c. |
| Cold-fn. shafting and screw stock: | |
| Rounds and hexagons | 3.92c. |
| Flats and squares | 4.42c. |
| Cold-roll. strip, soft and quarter hard | 4.00c. |
| Hoops | 3.42c. |
| Bands | 3.42c. |
| Hot-rolled sheets (No. 10) | 3.17c. |
| Hot-rolled ann'd sheets (No. 24)* | 3.65c. |
| Galvanized sheets (No. 24)* | 4.25c. |
| Long term sheets (No. 24) | 4.75c. |
| Standard tool steel | 12.00c. |
| Wire, black annealed (No. 10) | 3.30c. |
| Wire, galv. annealed (No. 10) | 4.05c. |

| | |
|-------------------------------------------|------------------|
| No. 1 yard wrought, long | \$6.50 to \$7.00 |
| Spec. iron and steel pipe | 5.75 to 6.00 |
| Forge fire | 5.50 to 6.00 |
| Rails for rolling | 8.00 to 8.50 |
| Short shoveling turnings | 3.00 to 3.50 |
| Machine shop turnings | 2.50 to 3.00 |
| Cast borings | 4.50 to 4.75 |
| No. 1 blast furnace | 2.50 to 3.00 |
| Cast borings (chemical) | 11.00 to 11.50 |
| Unprepared yard iron and steel | 4.50 to 5.00 |
| Per gross ton, delivered local foundries: | |
| No. 1 machinery cast | \$9.50 |
| No. 1 hvy. cast (cupola size) | 7.75 |
| No. 2 cast | 7.00 |

CINCINNATI

| | |
|---------------------------------------|------------------|
| Dealers' buying prices per gross ton: | |
| Heavy melting steel | \$8.25 to \$9.00 |
| Scrap rails for melting | 9.00 to 9.50 |
| Loose sheet clippings | 4.75 to 5.25 |
| Bundled sheets | 6.00 to 6.50 |
| Cast iron borings | 8.00 to 8.50 |
| Machine shop turnings | 5.50 to 6.00 |
| No. 1 busheling | 6.50 to 7.00 |
| No. 2 busheling | 3.50 to 4.00 |
| Rails for rolling | 9.50 to 10.00 |
| No. 1 locomotive tires | 9.00 to 9.50 |
| Short rails | 11.75 to 12.25 |
| Cast iron carwheels | 8.25 to 8.75 |
| No. 1 machinery cast | 9.50 to 10.00 |
| No. 1 railroad cast | 9.00 to 9.50 |
| Burnt cast | 6.50 to 7.00 |
| Store plate | 6.50 to 7.00 |
| Agricultural malleable | 8.50 to 9.00 |
| Railroad malleable | 9.00 to 9.50 |

Warehouse Prices for Steel Products

| | |
|-----------------------------------------------------------|-------------------|
| Tire steel 1/4 x 1/2 in. and larger | 3.40c. |
| Smooth finish. 1/2 x 3/4 in. and larger | 3.75c. |
| Open hearth spring steel, bases | 3.75c. to 10.00c. |
| Common wire nails, base, per keg \$3.00 | |
| Machine bolt, cut thread: Off List | |
| 1/4 x 6 in. and smaller | 60 |
| 1 x 30 in. and smaller | 60 |
| Carriage bolts, cut thread: Off List | |
| 1/2 x 6 in. and smaller | 60 |
| 1 x 20 in. and smaller | 50 |
| Boiler tubes: Per 100 Ft. | |
| Lap welded, 2-in. | \$18.05 |
| Seamless welded, 2-in. | 19.24 |
| Charcoal iron, 2-in. | 24.94 |
| Charcoal iron, 4-in. | 63.65 |
| *No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb. | |

ST. LOUIS

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Base per Lb. | |
| Plates and struc. shapes | 3.34c. |
| Bars, soft steel or iron | 3.14c. |
| Cold-fn. rounds, shafting, screw stock | 3.74c. |
| Hot-rolled annealed sheets (No. 24) | 3.94c. |
| Galv. sheets (No. 24) | 4.54c. |
| Hot-rolled sheets (No. 10) | 3.19c. |
| *Black corrug. sheets (No. 24) | 3.99c. |
| Galv. corrug. sheets | 4.59c. |
| Structural rivets | 3.58c. |
| Boiler rivets | 3.09c. |
| Tank rivets, 7/16 in. and smaller: Off List | |
| Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts | |
| 1000 lb. or over | 60 |
| 200 to 999 lb. | 55 and 5 |
| 100 to 199 lb. | 50 and 5 |
| Less than 100 lb. | 50 |
| *No. 26 and lighter take special prices. | |

PHILADELPHIA

| | |
|----------------------------------------------------------|---------|
| Base per Lb. | |
| *Plates, 1/4-in. and heavier | 2.75c. |
| *Structural shapes | 2.75c. |
| *Soft steel bars, small shapes, iron bars (except bands) | 2.75c. |
| *Reinforc. steel bars, sq. twisted and deformed | 2.505c. |
| Cold-finished steel bars | 3.73c. |
| *Steel hoops | 3.30c. |
| *Steel bands, No. 12 to 3/16 in., incl. | 3.05c. |
| Spring steel | 5.00c. |
| *Hot-rolled annealed sheets (No. 24) | 3.40c. |
| *Galvanized sheets (No. 24) | 4.00c. |
| *Hot-rolled annealed sheets (No. 10) | 2.95c. |
| Diam. pat. floor plates, 1/4 in. | 4.75c. |
| Swedish iron bars | 6.25c. |

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 50 bundles or over.
‡For 5 tons or more, exclusive of cutting charge.

CLEVELAND

| | |
|-------------------------------------|------------------|
| Base per Lb. | |
| Plates and struc. shapes | 3.21c. |
| Soft steel bars | 2.90c. |
| Reinforc. steel bars | 2.00c. to 2.50c. |
| Cold-finished steel bars | 3.40c. |
| Flat rolled steel under 1/4 in. | 3.26c. |
| Cold-finished strip | 5.55c. |
| Hot-rolled annealed sheets (No. 24) | 3.76c. |
| Galvanized sheets (No. 24) | 4.36c. |
| Hot-rolled sheets (No. 10) | 3.01c. |
| Black ann'd wire, per 100 lb. | \$2.45 |
| No. 9 galv. wire, per 100 lb. | 2.80 |
| Comm. wire nails, base per keg | 2.45 |

CINCINNATI

| | |
|--------------------------|--------|
| Base per Lb. | |
| Plates and struc. shapes | 3.30c. |
| Bars, soft steel or iron | 3.10c. |

DETROIT

| | |
|---------------------------------------|------------------|
| Dealers' buying prices per gross ton: | |
| Heavy melting steel | \$8.50 to \$9.00 |
| Borings and short turnings | 6.50 to 7.00 |
| Long turnings | 5.50 to 6.00 |
| No. 1 machinery cast | 9.00 to 9.50 |
| Automotive cast | 10.25 to 10.75 |
| Hydraulic comp. sheets | 8.75 to 9.25 |
| Store plate | 6.50 to 7.00 |
| New factory busheling | 7.00 to 7.50 |
| Old No. 2 busheling | 5.00 to 5.50 |
| Sheet clippings | 6.00 to 6.50 |
| Flashings | 7.25 to 7.75 |
| Low phos. plate scrap | 9.75 to 10.25 |

CANADA

| | |
|---------------------------------------|---------------|
| Dealers' buying prices per gross ton: | |
| Toronto Montreal | |
| Heavy melting steel | \$5.50 \$5.50 |
| Rails, scrap | 6.00 4.50 |
| Machine shop turnings | 2.50 2.50 |
| Boiler plate | 4.50 4.50 |
| Heavy axle turnings | 2.50 2.50 |
| Cast borings | 3.00 3.00 |
| Steel borings | 2.00 2.00 |
| Wrought pipe | 2.50 2.50 |
| Steel axles | 4.50 4.50 |
| Axles, wrought iron | 4.50 6.50 |
| No. 1 machinery cast | 7.75 9.00 |
| Store plate | 4.50 5.00 |
| Standard carwheels | 7.25 7.00 |
| Malleable | 6.75 7.00 |

| | |
|---------------------------------------|----------|
| New billet reinforce. bars | 3.10c. |
| Rail steel reinforce. bars | 3.10c. |
| Hoops and bands, 3/16 in. and lighter | 3.35c. |
| Cold-finished bars | 3.55c. |
| Hot-rolled annealed sheets (No. 24) | 3.85c. |
| Galv. sheets (No. 24) | 4.45c.</ |

Railroad Equipment

New York, New Haven & Hartford is inquiring on 50 steel coaches and a high-speed stream-line train such as developed by Union Pacific and Burlington roads. It is overhauling 1200 steel cars.

Louisiana & Arkansas is inquiring for three 2-8-2 type locomotives.

Alaska Railroad is inquiring for 20 55-ton hopper-bottom coal cars.

Central of Georgia has issued preliminary inquiries for purchase of 200 70-ton hopper cars.

Milwaukee Road is inquiring for 25 baggage cars.

Illinois Central has applied for a PWA loan to make heavy repairs to 16,015 freight cars and 228 passenger cars.

General American Car Co. is in the market for 150 refrigerator cars.

RAILS

St. Louis-San Francisco contemplates buying 26,000 tons of rails.

New York Central will purchase 40,000 tons of rails for delivery this year.

Atchison, Topeka & Santa Fe has awarded 34,700 tons of rails and 1600 kegs of bolts as follows: 23,871 tons of rails and 1200 kegs of bolts to Colorado Fuel & Iron Co.; 6818 tons of rails and 200 kegs of bolts to Illinois Steel Co.; 1704 tons of rails and 200 kegs of bolts to Inland Steel Co.; and 2307 tons of rails to Bethlehem Steel Co.

Lehigh & New England has ordered 400 tons of the plates from Carnegie Steel Co. and Bethlehem Steel Co.

Santa Fe has divided 5800 kegs of spikes among Illinois, Inland, Republic, Youngstown, Jones & Laughlin, Sheffield, Colorado and Pacific Coast Steel companies; also 3800 tons of the plates among Illinois, Inland and Colorado companies, and will buy 1410 tons of joints in near future.

Illinois Central has applied for PWA loan to buy 21,600 tons of 112-lb. rails, with necessary fastenings.

Pipe Lines

United States Engineer Office, Kansas City, Mo., asks bids until Feb. 3 for 1560 pieces flanged steel pipe for 28-in. pipe line suction dredge unit (Circular 2).

Mid-Western Refining Co., 506 Murray Building, Grand Rapids, Mich., Benjamin J. Skinner, head, plans welded steel pipe line from oil fields, Porter Township, Midland County, to Alma, Mich., for crude oil.

Kaplan, La., plans natural gas steel pipe line distributing system. Cost about \$65,000. Financing is being arranged through Federal aid.

Southern Counties Gas Co., 810 South Flower Street, Los Angeles, plans 6½-in. steel pipe gas line across Cerritos Channel, Long Beach, Cal., submerged to depth of at least 35½ ft. below mean water.

W. Moore & Son, Stamford, Tex., plans welded steel pipe line from natural gas fields, Brown County, to Kerrville, Tex., and vicinity, including smaller steel pipe lines for distribution systems at place noted and number of communities along route. Cost over \$1,000,000. Federal financing is being arranged.

Glenmora, La., plans welded steel pipe line from Oakdale, La., for natural gas supply. Cost \$65,000. Application has been made for Federal loan.

Lamou, La., plans welded steel pipe line system for natural gas distribution. Cost \$55,000. Federal financing is being secured.

Fort Peck, Mont., is inquiring for 3700 tons of 28-in. welded pipe.

Cast Iron Pipe

Boston will close bids Jan. 26 on 2450 tons of 6 to 16-in., class B.

Boston will close bids Jan. 25 on 350 tons of branches and curves.

Burrillville, R. I., plans pipe line system for water service in Harrisville district. Cost about \$125,000. Financing is being arranged. Jenks & Ballou, New Industrial Trust Building, Providence, R. I., are engineers.

Westernport, Md., plans line from Savage River for water supply. Cost about \$60,000. Charles D. Gandt, Whitaker Building, Baltimore, engineer.

Carolina Beach, N. C., plans 6, 8 and 10-in. for water service; also 10,000-gal. elevated tank. Cost \$50,000. Federal financing has been secured. J. L. Becton, engineer.

Macon, Ill., has awarded 250 tons to James B. Clow & Sons.

Chicago is taking bids on 205 tons of fittings for 3 to 24-in. water pipe.

Cedar Rapids, Iowa, plans main trunk lines to Vernon Heights, Country Club Heights and

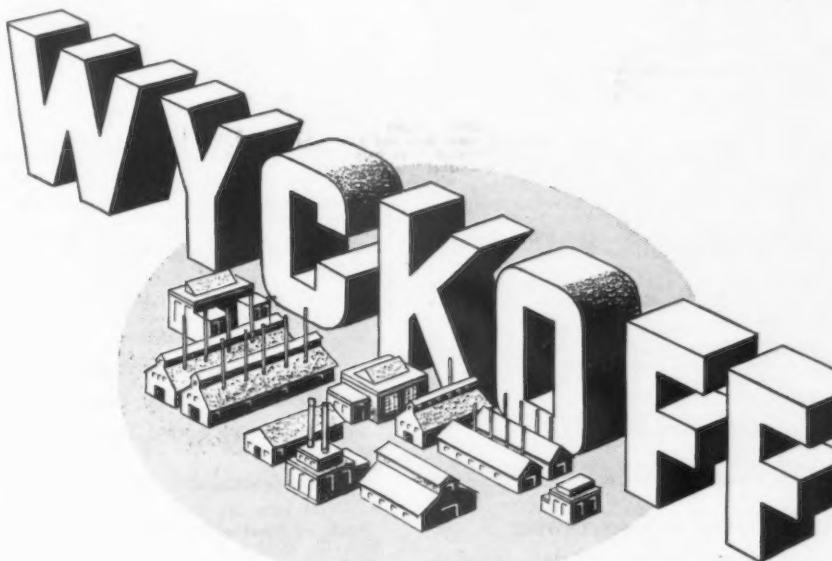
Kenwood Park Districts for water supply. Fund of \$140,000 has been secured through Federal aid. H. F. Bloomquist is superintendent of water department.

Oswego, Ill., plans about 12,000 ft. 4- and 6-in. for water service. Financing has been arranged. Engineering Service Co., Aurora, Ill., is engineer.

Kahoka, Mo., plans pipe line for extensions in water supply; also new filter plant. Fund of \$35,000 has been secured through Federal loan. Frank J. Beard is town engineer.

King County Water District No. 20, Boulevard Park, Philip L. Martin, secretary, R.F.D. No. 9, Seattle, plans extensions in water pipe line system. Cost about \$50,000. Financing is being arranged. Parker & Hill, Smith Tower Building, Seattle, engineers.

Dos Palos Water District, Dos Palos, Cal., George B. Smith, supervisor, plans pipe lines for extensions in system. Bond issue of \$25,000 is planned.



Industry's metallurgical guide

Laboratory standards prevail at every step in the production of WYCKOFF STEELS from the testing, selection and inspection of raw steel to the smooth polished finish, shape and dimension you require in your manufacturing processes. A good reason why you should make WYCKOFF your headquarters for Cold Drawn Steels, Turned and Polished Shafting, Turned and Ground Shafting.

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Fabricated Structural Steel

Lettings Decline—New Projects in Better Volume

AWARDS of 9850 tons are the lowest since the middle of November and compare with 30,140 tons a week ago. The only sizable booking was 4200 tons for bridges in Louisiana, which included 3800 tons for a bridge at Baton Rouge. New projects of 14,250 tons compare with 5800 tons last week and 11,500 tons two weeks ago. The midtown tunnel in New York will require 5000 tons instead of 2000 tons, as previously reported, and is the largest inquiry out. A bridge at Fort Peck, Mont., calls for 2000 tons, for which bids will be taken by the United States Engineer at Kansas City. Structural steel awards for the week follow:

STRUCTURAL AWARDS

NORTH ATLANTIC STATES

North Adams, Mass., 365 tons, State highway bridge, to McClintic-Marshall Corp., previously reported to an unnamed fabricator.

Medford, Mass., 750 tons, State bridge over Mystic River, to Boston Bridge Works, Inc.; previously reported as 400 tons.

Liberty, N. Y., 290 tons, State highway bridge, to McClintic-Marshall Corp.

Bound Brook, N. J., 165 tons, building for Rubberoid Co., to McClintic-Marshall Corp.

Ulster County, N. Y., 215 tons, highway bridge, to National Bridge Works.

Elmira, N. Y., 140 tons, canopies for Erie Railroad station, to R. S. McManus Steel Construction Co.

Hunterdon County, N. J., 180 tons, highway bridge, to McClintic-Marshall Corp.

Philadelphia, 375 tons, turbine supports, Port Richmond station, Philadelphia Electric Co., to McClintic-Marshall Corp.

Washington, 740 tons, foundations for Library of Congress Annex, to McClintic-Marshall Corp.

SOUTH AND SOUTHWEST

Shelby County, Tenn., 115 tons, highway bridge, to Pidgeon-Thomas Iron Co.

Alcorn and Bolivar Counties, Miss., 235 tons, highway bridges, to Virginia Bridge & Iron Co., Inc.

State of Louisiana, 4200 tons, bridges, including 3800 tons for a bridge at Baton Rouge, to Wicham Bridge & Boiler Co.

Camden, Ark., 100 tons, highway bridges, to Pidgeon-Thomas Iron Co., Memphis.

CENTRAL STATES

Marietta, Ohio, 155 tons, municipal grandstand, to Pittsburgh-Des Moines Steel Co.

Hagerstown, Ind., 155 tons, building for Perfect Circle Piston Ring Co., to Insley Mfg. Co.

Jackson County, Ill., 120 tons, highway bridge, to Midland Structural Steel Co.

Monroe County, Mo., 120 tons, highway bridge, to St. Louis Structural Steel Co.

Lafayette County Mo., 115 tons, to St. Joseph Structural Steel Co.

Jefferson, Greene, and Oregon Counties, Mo., 650 tons, highway bridges, to Midland Structural Steel Co.

Scott County, Mo., 280 tons, highway bridge, to Illinois Steel Bridge Co.

Cloud County, Kan., 450 tons, highway bridge, to Pittsburgh-Des Moines Steel Co.

State of Nebraska, 400 tons, bridges, to Wicham Bridge & Boiler Co.

WESTERN STATES

Snoqualmie, Wash., 100 tons, State bridge, to Isaacson Iron Works.

Richmond, Cal., 150 tons, school, to Schrad Iron Works.

San Francisco, 150 tons, Golden West brewery, to Western Iron Works.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 5000 tons, previously announced as 2000 tons, tunnel and shaft work for Midtown tunnel under Hudson River; bids Feb. 6 to Port of New York Authority.

Elmira, N. Y., 300 tons, cell block F in penitentiary.

Auburn, N. Y., 300 tons, State penitentiary building.

West Point, N. Y., 800 tons, addition to Military Academy gymnasium.

West Elizabeth, Pa., 200 tons, State highway bridge.

State of Maryland, 225 tons, State highway bridges.

SOUTH AND SOUTHWEST

Fort Knox, Ky., 350 tons, buildings.

Fort Bragg, N. C., 500 tons, stables and guard quarters.

State of Georgia, 350 tons, State highway bridges.

State of Florida, 325 tons, highway bridge; Nashville Bridge Co. low bidder.

State of Texas, 325 tons, three bridges.

State of Oklahoma, 600 tons, highway bridges; bids opened Jan. 16.

CENTRAL STATES

State of Ohio, 170 tons, four highway bridges in Adams, Carroll, Highland and Muskingum counties; bids taken Jan. 19.

Fairport, Ohio, 1400 tons, sheet steel piling for bulkheads and breakwater for United States Engineers; bids rejected and work to be readvertised.

Huron, Ohio, 1750 tons sheet steel piling, breakwater for United States Engineers.

Dubuque, Iowa, 1200 tons, dam across Mississippi River; Warner Construction Co., low bidder on general contract; Lakeside Bridge & Steel Co. low bidder on structural work.

State of Iowa, 400 tons, three bridges.

Iowa City, Iowa, 225 tons, field house for University of Iowa.

State of Missouri, 1200 tons, 20 bridges.

Kansas City, Mo., 6000 tons, municipal auditorium; new bids to be taken Feb. 7.

WESTERN STATES

Fort Peck, Mont., 2000 tons, bridge, bids to be taken by United States Engineer at Kansas City.

Willits, Cal., 300 tons, bridge.

Alameda, Cal., 1500 tons, bridge.

State of California, 140 tons, bridges; bids Jan. 22.

Wapato, Wash., 130 tons, material for Indian Irrigation Service; bids under advisement.

Seattle, 900 tons, State viaduct at Fourth Avenue, South; bids under advisement.

FABRICATED PLATE

AWARDS

Santa Cruz, Cal., 300 tons, two tanks, to Pittsburgh-Des Moines Steel Co.

Reinforcing Steel

Awards 4000 Tons—New Projects 4200 Tons

AWARDS

Suffolk County, N. Y., 100 tons, highway bridge, to Joseph T. Ryerson & Son, Inc.

State of Ohio, 230 tons, culvert at North Olmstead, to Patterson-Leitch Co., Cleveland.

Saverton, Mo., 650 tons, dam across Mississippi River, to Lackde Steel Co.

Alton, Ill., 1500 tons, dam across Mississippi River, to an unnamed bidder.

Manteno, Ill., 700 tons, State hospital building, to Concrete Engineering Co.

Oregon, Ill., 500 tons, bridge, to Calumet Steel Co.

Muscatine, Iowa, 535 tons, dam, to Inland Steel Co.

Fort Lewis, Wash., 175 tons, seawall, to Pacific Coast Steel Corp.

NEW REINFORCING BAR PROJECTS

Brentwood, L. I., 400 tons, State hospital; La Sala Mason Corp. low bidder.

Queens and Nassau Counties, N. Y., 800 tons, highway structures; bids in Jan. 26.

Saratoga County, N. Y., 250 tons, highway; bids Jan. 26.

New York, approximately 800 tons, Hudson River tunnel; bids in Feb. 6 to Port of New York Authority.

Chicago, 700 tons, sewer for Sanitary District; bids taken Jan. 18.

Chicago, tonnage being estimated, completion of outer drive bridges and approaches.

Sacramento County, Cal., 215 tons, widening State bridge over American River; bids Jan. 31.

Los Angeles, 165 tons, Figueroa Street tunnel No. 4; bids soon.

Los Angeles, 400 tons, two bridges on Gaffey Avenue; bids soon.

Pierce County, Wash., 130 tons, State crossing; bids under advisement.

Seattle, 200 tons, State viaduct at Fourth Avenue South; bids under advisement.

New Haven Gets \$2,000,000 for Cars

WASHINGTON, Jan. 16. — The New York, New Haven & Hartford railroad has been allotted \$2,000,000 by the PWA to be used for the purchase of 50 new passenger cars. In making announcement of the allotment yesterday, Public Works Administrator Harold L. Ickes said that work will get under way in March according to the application filed by the New Haven. A previous allotment of \$3,500,000 was made to the New Haven to enable the carrier to repair and rebuild locomotives, cars and other equipment.

St. Louis Road Prepares To Make Rail Purchase

ST. LOUIS, Jan. 16.—An application of the trustees of the St. Louis-San Francisco Railway to the Federal Court for permission to ask for a PWA loan of \$1,442,545 to buy 26,000 tons of rails, and accessories including 42,600 pairs of rail joints, 4956 tons of tie plates, 9570 kegs of track spikes and 1935 kegs of track bolts, has been referred to a special master for hearing.

Warner Brothers, Chicago, are the low bidders on lock No. 11 at Dubuque, Iowa, requiring 1250 tons of sheet piling, 950 tons of structural steel and 500 tons of reinforcing bars.

New bids have been asked for Feb. 7 for the Municipal Auditorium at Kansas City, requiring 6000 tons of structural steel. The State of Oklahoma will open bids Jan. 6 for highway bridge projects requiring 600 tons of structural steel.

State highway commission awards of structural steel for bridges during the last week included: Missouri, 873 tons; Mississippi, 211 tons; Kansas, 1100 tons. The State of Kansas is in the market for 280 tons of sheets for automobile license plates.

More than 5000 tons of pig iron was sold here during the last week. Orders ranged from a carload up to 2000 tons, and were for shipment through the first quarter. Nearly all of this was foundry iron and of Northern make.

The scrap iron market took on added strength during the week, and No. 2 heavy melting, railroad springs, rails for rolling and railroad malleable were 25c. a ton higher. While there was no buying by consumers, mills are said to be in a mood to buy, awaiting the point when they and dealers can agree on prices. Missouri Pacific offers a list of 100 carloads.

Canadian Output Holds At 50 Per Cent Rate

TORONTO, Ont., Jan. 16.—New business in iron and steel is appearing in better volume, but individual orders are mostly in small lots. Steel mills, with orders booked last year and the new business coming in, are said to be assured of maintaining operations at the current level, close to 50 per cent capacity, for the next three or four months. The mining industry is facing the best year in its history and large orders for equipment and steel are expected from this source.

Demand for merchant pig iron is in better volume. Sales for the week exceeded 500 tons and new orders are appearing at regular intervals. Pig

iron production is holding at the rate reported for the closing weeks of 1933. Prices are firm and unchanged.

Trading in scrap, while better than that of a couple of weeks ago, continues spotty with special grades featuring current transactions. Demand for heavy melting steel and turnings is negligible and movement is slow between dealers and consumers. Iron grades are furnishing the bulk of new business. The supply of cast scraps is limited, and dealers are said to be importing from the United States to fill orders. Prices are unchanged.

Scrap in Further Advance at Detroit

DETROIT, Jan. 16.—Scrap prices have advanced 25c. to 50c. a ton, largely in anticipation of early steel mill buying. Hydraulic bundles are bringing 25c. a ton more than heavy melting steel because of the local steel plant's preference for this item. Cast iron grades have moved up along with the steel grades. Scrap is coming on to the market much more freely than it did a few weeks ago.

Trackwork Production Up Slightly in 1933

PRODUCTION of trackwork for tee rail track of 60 lb. a yd. and heavier amounted to 30,824 net tons in 1933, according to the American Iron and Steel Institute, compared with 27,278 tons in 1932 and with 60,901 tons in 1931. December, 1933, output was 2759 tons, as against 2087 tons in November and 1845 tons in December,

1932. These figures include all special or fabricated tee rail trackwork, such as switches, switch stands, frogs, crossings, guard rails and appurtenances.

Approves \$10,000,000 Loan to Illinois Central

WASHINGTON, Jan. 16.—The I.C.C. yesterday announced approval of an application of the Illinois Central railroad to borrow \$10,000,000 from the PWA to be used for maintenance work. The loan has been allotted by the PWA.

The carrier will purchase 21,600 tons of 112-lb. rails, together with the necessary track fastenings, to renew about 123 miles of track and make heavy general repairs to 16,015 miscellaneous freight cars and to 228 passenger cars. It will also build a new bridge to replace the one now in operation at Big Clifty, Ky., and renew the approach spans of a bridge at Cairo, Ill. It is further proposed to expend \$215,000 for relining a tunnel at Reevesville, Ill.

Rails, fastenings and cross ties will cost \$1,254,000. Repairs to the freight cars will cost \$6,210,555. Repairs to the passenger cars will cost \$1,100,300. The new bridge at Big Clifty will cost \$167,000 and renewal of approach spans at Cairo will cost \$870,000.

Frank Samuel & Co., Inc., Harrison Building, Philadelphia, has been appointed sole agent in America for the sale of iron, manganese and manganese ores of A. Thun & Co., Ltd., Rio de Janeiro, Brazil.



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PLANT EXPANSION AND EQUIPMENT BUYING

Inquiries for Machine Tools Indicate Retooling Interest

BUICK offices in Flint continued, last week, to be headquarters for the machine tool industry. Among the purchases, "winding up" the Buick retooling program was that of 12 hobbing machines from a Rockford, Ill., maker. Aside from its large machine tool purchases, Buick has a tool and die program involving over \$1,000,000. Orders are to be placed this week.

Dealers in the Chicago area report 1933 sales varying from 30 to 40 per cent heavier than 1932 volume. At the present moment there is quite a lull in new business but inquiries are fairly brisk, one dealer having quoted on \$60,000 worth of new equipment since the opening of the new year. All inquiry is scattered, there being no lists open at this time. The Milwaukee road has not bought all of its list for Deer Lodge, Mont., where it had a fire early in the fall.

A Cleveland dealer reports recent

inquiries from the steel, rubber, house appliance and automobile parts industries for \$35,000 worth of machine tool equipment for replacement purposes. However, in a good many cases these are coming from companies that are just looking around and have not secured authorization for the purchase of new equipment.

Current improvement in machine tool demand in the Cincinnati district has not been reflected in general increase in factory operations since a large number of orders have been filled directly from stock machines. Among milling machine and grinder manufacturers, however, a slight increase in payrolls is noted. Orders from the East for single machines have been reported and one order from Detroit for six upright drills constitutes the outstanding week's business. Inquiry is unusually brisk and indicates a more sincere interest of users to retool.

◀ NORTH ATLANTIC ▶

Swift & Co., Inc., 32 Tenth Avenue, New York, meat packer, has plans for new branch storage and distributing plant, including refrigerating plant and market unit at Flushing, L. I. Cost over \$80,000 with equipment. A. M. Ives is company architect, address noted.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until Jan. 29 for 44 steel gas buoy bodies, sizes from 9 ft. diameter and 38 ft. long to 5 ft. diameter and 15 ft. long, with skeleton lantern towers and bottom counterweights, some with bells and some with whistles.

New York Metal Spinning & Stamping Corp., New York, has been organized under direction of Louis F. Witoff, 220 Broadway. Company will take over New York Metal Spinning & Stamping Co., 56 West Twenty-second Street.

Marine Airport Corp., subsidiary of Pan-American Airways, Inc., 135 East Forty-second Street, New York, has purchased 10-acre tract at Manor Haven, Manhasset Bay, L. I., formerly owned by American Aeronautical Corp., and will remodel present buildings and erect new units for new airplane base for proposed transatlantic airway lines, including hangars, machine shops and parts production, rebuilding, repairs, testing, etc., assembling shop and other departments. Cost over \$150,000 with equipment.

Rubel Corp., 937 Fulton Street, Brooklyn, has filed plans for extensions and improvements in one-story brewery at 413-17 Bond Street. Cost over \$40,000 with equipment. Alfred H. Eccles, 29-09 Bridge Plaza, Long Island City, is architect.

Thomas Evans Co., Inc., New York, has been organized by Thomas Evans, 12 Oakland Terrace, Maplewood, N. J., and Wilkin A. Evans, 81 Concord Avenue, Glen Rock, N. J., capital \$100,000, to manufacture aluminum products.

Central Rural School District No. 1, Tupper Lake, N. Y., plans manual training department in new multi-story senior and junior high school. Cost \$300,000 with equipment. Bonds have been voted in such sum.

Atlas Import & Export Corp., New York, wines and liquors, recently organized, has

leased six-story building at 190-92 Greene Street for new storage and distributing plant.

Board of Education, Huntington, L. I., has secured Federal loan for \$550,000 for new multi-story senior and junior high school, with manual training department, and plans early construction. R. Burdick is school superintendent.

Water Board, Amityville, L. I., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for new municipal water system. Fund of \$400,000 is being arranged. Russell G. Cory, 30 Church Street, New York, is engineer.

American Armament Corp., New York, has been organized by Herbert Benjamin, 608 Rugby Street, Brooklyn, and associates, to manufacture tools and mechanical equipment.

California Spray Chemical Co., 15 Shattuck Square, Berkeley, Cal., manufacturer of special chemicals, sprayers, etc., has purchased two buildings at Bayway and Rockefeller Street, Elizabeth, N. J., for new Eastern branch plant.

United Appliance Corp., Hoboken, N. J., has been organized by Benedict A. Beronio, 331 Grand Street, and associates, capital \$100,000, to manufacture heating appliances and equipment.

Borough Council, Sayreville, N. J., plans installation of electric pumping machinery with capacity of 500 gal. a min., booster pumping units, pressure filters, tank, pipe lines, etc., for municipal water system. Application has been made for Federal aid for \$40,000.

Board of Education, Picataway Township, New Market, N. J., plans manual training department in new two-story high school. Cost \$150,000. J. N. Pierson & Son, Perth Amboy National Bank Building, Perth Amboy, N. J., are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 23 for one motor-driven horizontal boring, drilling and milling machine (Schedule 1562) for Philadelphia Navy Yard.

Constructing Quartermaster, Air Depot, Middletown, Pa., has plans for two new buildings for airplane engine test hangar and engine test shop respectively. Bids are being asked until Jan. 22 for power house for central heating service (Circular 12).

◀ NEW ENGLAND ▶

New England Chemical Industries, Inc., Woburn, Mass., a subsidiary of Consolidated Chemical Industries, Inc., New York, has plans for new two-story plant, 120 x 540 ft. Cost about \$150,000 with equipment.

Atlas Spring Coil Co., Inc., Beverly, Mass., manufacturer of coil springs, etc., has purchased three-story and basement factory at 316 Rantoul Street for new plant, expanding present capacity.

Hartford Engine Works, Inc., Hartford, Conn., has been organized by Harry D. Blanchard and Alfred E. Blatter, 41 Sheldon Street, to manufacture engines and parts and kindred equipment.

Eagle Signal Corp., Newton, Mass., has been organized by Vincent C. Stanley and William C. Beck, Newton, to manufacture signal devices and equipment.

Board of Selectmen, Sudbury, Mass., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal water supply system. Cost about \$100,000. Financing is being arranged. Fay, Spofford & Thorndike, 44 School Street, Boston, are engineers.

Board of Selectmen, Auburn, Mass., Henry Sibley, chairman, building commission, plans manual training department in new high school. Cost \$250,000. L. W. Briggs, 314 Main Street, Worcester, Mass., is architect.

◀ BUFFALO DISTRICT ▶

Water Board, Niagara Falls, N. Y., plans installation of pumping machinery and auxiliary equipment, new heading plant and addition to filter works, pipe lines, etc., for extensions in water supply system. Fund of \$445,000 has been arranged. W. D. Robbins is city manager.

Graves-Pierce Mfg. Co., Inc., Friendship, N. Y., has been organized by Victor H. Graves, Friendship, and James F. Pierce, 307 York Street, Olean, N. Y., to manufacture steel and other metal products.

Kellogg Co., Battle Creek, Mich., manufacturer of cereal products, has let general contract to Carter-Halls-Aldinger, Ltd., Windsor, Ont., for four-story and basement addition, 95 x 102 ft., to plant of Kellogg Co. of Canada, Ltd., London, Ont., a subsidiary, for storage, packing, distribution and other service. Cost about \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

Board of Public Service, Lorain, Ohio, Robert Sewan, director, plans new municipal electric light and power plant. Cost about \$1,500,000 with machinery. Financing is being arranged. H. F. Harmount, 2417 Oak Park Avenue, Cleveland, is consulting engineer.

Ohio Valve & Mfg. Co., Columbus, Ohio, has been organized by Ray A. McFayden and Dwight A. Swisher, 21 East State Street, to manufacture valves and kindred engineering specialties.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Jan. 24 for aircraft bolts, clevis bolts, steel check nuts, steel plate nuts, flat head pins, cable eye turnbuckle assemblies, etc. (Circular 212), roller bearings, rear axle sleeves, ball bearings, bearing assemblies, pins, bushings, caps, gears, nuts, gaskets, springs, rings, pulleys, bearings, etc. (Circular 214); until Jan. 30, one motor-driven power press (Circular 221), one motor-driven tool room precision lathe (Circular 211).

City Council, Oberlin, Ohio, L. A. Sears, city manager, has plans for new municipal electric light and power plant, using Diesel engine-generator units. Cost \$250,000 with equipment. Financing has been arranged. R. Husselman,

Hippodrome Building, Cleveland, is consulting engineer.

City Council, New Philadelphia, Ohio, plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal water system. Federal loan of \$55,000 has been secured.

Chevrolet Motor Co. of Ohio, 4726 Smith Road, Norwood, Cincinnati, has let general contract to Austin Co., Cleveland, for one-story addition to local assembling plant, 80 x 175 ft., for inspection and other service. Cost about \$65,000 with equipment.

Crown Cork & Seal Co., 212 East Third Street, Cincinnati, manufacturer of metal bottle caps and seals, sealing machine, etc., with headquarters at Baltimore, has leased one-story and basement building at Spring Grove Avenue and Alabama Street, Cincinnati, and will remodel for new factory branch, storage and distributing plant.

Arup Mfg. Corp., 1032 East Jefferson Boulevard, South Bend, Ind., has been organized by Cloyd L. Snyder, H. A. McCollough and Otto H. Collmer, capital \$200,000, to manufacture airplanes and parts.

Distillers Corp.-Seagrams, Ltd., Montreal, operating distilleries at Montreal and Waterloo, Ont., has organized subsidiary under name of Joseph E. Seagram & Sons, Inc., to take over plant of Rossville Union Distilleries, Inc., Lawrenceburg, Ind., recently acquired. Extensions and improvements will be made, including equipment.

Faultless Caster Corp., 1421 North Garvin Street, Evansville, Ind., has been organized by Bernhard H. and W. H. Noelting, to manufacture casters and other hardware specialties.

◀ SOUTH ATLANTIC ▶

Dixie Portland Flour Co., 734 Pennsylvania Avenue, Memphis, Tenn., has leased building at Savannah, Ga., for new branch plant, and will install equipment for mixing, batching, conveying, bagging and other service. Machinery installation will cost close to \$28,000.

State Highway Department, Columbia, S. C., Benjamin M. Sawyer, commissioner, plans construction of rural electrical distributing lines in different parts of State, with substation and service facilities. Initial work totals about 4775 miles. Fund of \$5,912,000 is being arranged through Federal aid. Later additional lines will be built, with ultimate cost over \$20,000,000.

City Council, Pahokee, Fla., plans installation of pumping machinery and auxiliary equipment for new municipal waterworks, with pipe lines and fittings. Cost about \$100,000. Financing is being arranged. C. V. Rafu, Clewiston, Fla., is engineer.

Motor Parts & Gear Co., Charlotte, N. C., has been organized by Malcolm Fraser, Charlotte, and John C. Rogers, 63 West Twenty-eighth Street, N. W., Atlanta, Ga., capital \$100,000, to manufacture gears and gearing systems, automotive parts and other equipment.

◀ WASHINGTON DISTRICT ▶

Ordnance Department, Washington, plans early purchase of machine tools and other shop equipment for modernization of arsenals and stations at Springfield, Mass.; Watervliet, Watertown and West Point, N. Y.; Picatinny and Raritan, N. J.; Frankford, Philadelphia;

Aberdeen, Md.; Charleston, S. C.; Fort Benning and Augusta, Ga.; Rock Island and Fort Knox, Ill.; Fort Sill, Okla.; and San Antonio, Tex. Fund of \$2,309,491 is being arranged.

General Purchasing Officer, Panama Canal, Washington, asks bids until Jan. 24 for 25,000 ft. solid copper wire, 100 suspension insulators, galvanized pipe flanges, flanged unions, brass unions, gate valves, angle valves, check valves, reducing couplings, steam cocks, stop cocks, floor flanges, etc. (Schedule 2932).

Bureau of Yards and Docks, Navy Department, Washington, has secured fund of \$800,000 for new radio station and radio communication facilities at Pearl Harbor, T. H., including steel towers, station and power units, etc.; also \$600,000 for similar radio facilities at Summit, Canal Zone.

International Distillery & Distributing Corp., Charles and Lombard Streets, Baltimore, recently organized, plans extensions and improvements in four-story and basement building, location noted, for storage and distribution. Cost about \$28,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 23 for taps, dies, die stocks, wrenches, etc. (Schedule 1534) for Eastern and Western yards.

Constructing Quartermaster, Albrook Field, Canal Zone, asks bids until Jan. 30 for new gasoline fueling system (Appropriation of \$61,675 is available).

City Council, Asheville, N. C., plans hangars with repair and reconditioning shops, oil storage and distributing plant, and other field units at new municipal airport. Fund of \$706,000 is being arranged for project. Joseph W. Little is chairman of airport committee, in charge.

◀ MIDDLE WEST ▶

United States Property and Disbursing Officer, Militia Bureau, State Arsenal, Springfield, Ill., asks bids until Jan. 23 for extensions and improvements in equipment warehouse, pumping plant and pumping equipment at Camp Grant, Rockford, Ill.

Belleville Township High School Board, Belleville, Ill., plans manual training department in new multi-story high school. Bond issue of \$200,000 has been approved and financing is being arranged. O. W. Rubach, Belleville Bank Building, is architect.

Apex Mfg. Co., 2815 Irving Park Boulevard, Chicago, has been organized by Fred H. Schleser and Benjamin Brummer, to manufacture metal spring specialties, spring covers, etc.

L. C. Pinault, Granite Exchange Building, St. Cloud, Minn., architect, has plans for new brewery on site near city, for company whose name is temporarily withheld, work to begin early in spring. Cost over \$100,000 with equipment.

Construction Service, Veterans' Administration, Washington, asks bids until Feb. 6 for new boilers and accessories, and fuel-burning equipment at institution at Knoxville, Iowa.

Common Council, Villisca, Iowa, has plans for new municipal electric light and power plant, using Diesel-engine generator units. Cost \$114,000. Federal financing is being arranged. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Department of Interior, Washington, E. K. Dewey, Great Falls, Mont., resident construction engineer, in charge, will take bids soon

for equipment and materials for new power transmission line from point near Great Falls to new Fort Peck power dam, near Glasgow, Mont., about 275 miles, including about 900 miles copper wire, line hardware, fittings, etc.

United States Engineer Office, Milwaukee, asks bids until Jan. 25 for one clamshell dredging bucket, 3-cu. yd. capacity (Circular 111).

Theodore Hamm Brewing Co., 681 East Minnehaha Street, St. Paul, Minn., has plans for extensions and improvements in four-story brew-house, including new equipment; similar program will also be carried out in bottling works. Cost over \$70,000 with equipment. C. H. Johnston, 360 Robert Street, is architect.

◀ WESTERN PENNA. ▶

Frank J. Parker, Titusville, Pa., is negotiating for acquisition of former plant of United States Radiator Co., and will remodel for new distillery. A company will be organized to carry out project.

General Stove Corp., 1007 Aerial Building, Erie, Pa., John J. Galbo, head, plans new one-story plant, including foundry and assembling units. Cost about \$35,000 with equipment.

Town Council, Lewisburg, W. Va., plans installation of pumping machinery and accessory equipment, pipe lines and fittings for new municipal waterworks. Federal loan of \$52,000 is being arranged.

Schenley Distillers Corp., Schenley, Pa., has let general contract to Frank Messer & Sons, Inc., 2513 Burnet Avenue, Cincinnati, for three-story addition to plant of Old Quaker Distilling Co., Lawrenceburg, Ind., 140 x 160 ft. Cost over \$200,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

◀ SOUTHWEST ▶

Chevrolet Motor Co., 6801 East Thirty-seventh Street, Kansas City, Mo., has let general contract to Austin Co., Chicago, for one-story addition to local assembling plant, 81 x 200 ft. Cost about \$75,000 with equipment.

Common Council, Pattonsburg, Mo., plans new municipal electric light and power plant, using Diesel engine-generating unit. Cost about \$67,400. Financing is being arranged through Federal aid. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

United States Engineer Office, Kansas City, Kan., asks bids until Feb. 3 for 160 cast steel ball joints for 28-in. pipe line suction dredge units (Circular 3).

Harbor Board, City Hall, Kansas City, Mo., has plans for new grain elevator, 3,000,000 bu. capacity, in connection with new dock on Missouri River, including elevating, conveying, screening and other equipment. Project will include railway on dock, pumping plant and sewerage system. Cost about \$2,000,000, of which \$1,700,000 will be secured through Federal loan. Horner & Wyatt, Board of Trade Building, are consulting engineers; Walter F. Schulz, Memphis, Tenn., is associate engineer.

Common Council, Ava, Mo., plans new municipal electric light and power plant. Cost \$59,000. Financing is being arranged. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

Dallas Air Conditioning Co., Inc., Dallas, Tex., has been organized by W. W. Fuller

HY-TEN "M" TEMPER

HIGH CARBON NI-CR-MO ALLOY STEEL

HARD AND TOUGH WHEN OIL-HARDENED

ANNEALED ROUND AND FLAT SECTIONS IN STOCK

WHEELOCK, LOVEJOY & COMPANY, Inc.

CAMBRIDGE

CHICAGO

CLEVELAND

DETROIT

NEW YORK

and S. Y. Guthrie, Dallas, to manufacture air-conditioning equipment and systems.

Common Council, Amarillo, Tex., plans installation of pumping machinery and auxiliary equipment, pipe lines and fittings for extensions and improvements in municipal waterworks. Federal loan for \$186,000 has been secured.

M. K. Goetz Brewing Co., St. Joseph, Mo., L. A. Keck, Albemarle and Sixth Streets, head, has plans for new multi-story plant. Cost over \$100,000 with equipment. George L. Lehle, 111 West Washington Street, Chicago, is architect.

City Council, Hannibal, Mo., plans extensions and improvements in municipal electric light and power plant, with installation of new generating unit and accessories. Cost about \$250,000. Financing is being arranged.

◀ SOUTH CENTRAL ▶

Bonnie Brothers, Inc., Thirty-fourth and Bank Streets, Louisville, distiller and rectifier,

recently reorganized with capital of \$1,000,000, plans new multi-story still house on adjoining site. Cost over \$75,000 with equipment. W. O. Bonnie is president.

Town Council, Arab, Ala., asks bids until Jan. 23 for equipment for municipal waterworks, including two deep-well pumping units, tank and tower, water meters, pipe, fittings, etc. J. B. McCrary Co., Atlanta, Ga., is consulting engineer.

City Council, Alexandria, La., plans extensions and improvements in municipal electric light and power plant, including boilers and auxiliary equipment, intake tower, spray pond equipment and other machinery. Fund of \$250,000 has been secured through Federal loan.

United States Engineer Office, Vicksburg, Miss., asks bids until Jan. 23 for construction of stern wheel snag and channel boat, 195 ft. long and 38 ft. wide, with oil-burning boiler plant, and derrick.

Common Council, Lexington, Miss., plans new municipal electric light and power plant and electrical distributing system. Cost about

\$100,000. Financing is being arranged. John T. Sharp, Jackson, Miss., is consulting engineer.

◀ MICHIGAN DISTRICT ▶

Four Flags Brewing Co., Niles, Mich., has let contract to Edwards & Co., South Bend, Ind., for addition. Improvements will also be made in present brewery. Cost about \$80,000 with equipment. Newhouse & Bernham, Inc., 8 South Michigan Avenue, Chicago, is architect.

T. J. Watts Laundry Machinery Co., St. Joseph, Mich., has been organized by T. J. Watts, 620 Langley Avenue, and associates, to manufacture laundry machinery and parts.

Domestic Appliance Corp., Grand Haven, Mich., recently organized to manufacture washing machines and parts, has leased space at plant of Story & Clark Piano Co., and will provide facilities to develop daily capacity of close to 100 washing machine units. N. E. Walker is production manager.

Madison Foundry Co., Detroit, has been organized by Howard H. Newman, 1488 Madison Avenue, to manufacture iron and other metal castings.

◀ PACIFIC COAST ▶

Schinner-Hofmann Brewing Co., Long Beach, Cal., care of H. W. Funke, 620 Jergins Trust Building, head, plans new multi-story plant on Long Beach Boulevard. Cost over \$125,000 with equipment. A one-story power house will be built.

City Council, Petaluma, Cal., plans new electric-operated pumping plant, filter plant, pipe lines, etc., for new sewage disposal plant and system. Cost \$150,000 with machinery. Federal financing is being arranged. L. H. Nishkian, 525 Market Street, San Francisco, is engineer.

Arizona Magma Mineral Co., Chloride, Ariz., C. J. Carpenter, president, plans new milling plant at local mining properties. Cost over \$85,000 with equipment.

Century Brewing Co., 3100 Airport Way, Seattle, has leased property of Cudahy Packing Co., Portland, Ore., for new branch brewing plant. It is proposed to build new brewery at Portland soon. Cost over \$100,000 with equipment.

Constructing Quartermaster, Fort Lewis, Wash., asks bids until Jan. 25 for new ordnance repair shop. Appropriation of \$30,000 is available.

Western Brewing Co., Seattle, care of E. C. Rising, 5033 Seventeenth Street, N. E., has plans for new multi-story brewery on East Marginal Way, including power house, machine shop and other units. Cost about \$225,000 with equipment.

Board of City Trustees, South Pasadena, Cal., O. S. Roen, city manager, plans installation of 150,000-gal. elevated tank and tower, pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal water system. Cost over \$70,000. Financing is being arranged.

Vernon Brewing Co., 5151 Santa Fe Avenue, Vernon, Cal., has plans for two-story addition, 36 x 94 ft., for storage and distribution. Lionel Linck, address noted, is company architect.

American Tractor Equipment Co., 5301 Horton Street, Oakland, Cal., manufacturer of road-building machinery and parts, dirt movers, scrapers, pumps, etc., has arranged for merger, under first noted name, with Knapp Mfg. Corp., same place, manufacturer of similar machinery. Production will be concentrated at Horton Street plant, where additions will be made to line of output, including new hydraulic equipment, road builders and trailers. J. F. Knapp will be head of new company; Guy D. Reynolds, secretary and general manager.

◀ FOREIGN ▶

Japan-Manchukuo Magnesium Mfg. Co., Tokyo, Japan, Eiryo Smal, executive director, has begun erection of new plant at Ube (Kysubu), including power house, machine shop and other operating structures, and is scheduled for completion in July. Cost over \$500,000 with machinery.

Southern Railway, London, England, plans electrification of about 110 miles of line, including line between Orpington and Sevenoaks, Kent County, about 80 miles, and in south coast district. Cost about £2,000,000 (\$10,240,000) with equipment.

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| Sizes up to and including 2 7/16" | + .000" |
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LUBRICANT:
 1 PART SUNOCO TO
 10 PARTS WATER

Courtesy of **HUPP Motor Car Corp., Fostoria Div.**

OPERATION: MILLING CRANKSHAFT COUNTERWEIGHTS.
 MACHINE: CINCINNATI HYDROMATIC MILLER.
 MATERIAL: COLD DRAWN STEEL.
 SPINDLE SPEED: 65 R. P. M.
 FEED: 8 INCHES PER MINUTE.



COOLANT:
 1 PART SUNOCO TO
 40 PARTS WATER

Courtesy of **CLEVELAND TRACTOR Co., Cleveland**

OPERATION: FINISH GRINDING, LOWER TRACK WHEEL
 SHAFT, ALL BEARING DIAMETERS AND BOTH SHOULDERS.
 MACHINE: CINCINNATI PLUNGE CUT GRINDER, DOUBLE
 WHEEL.
 MATERIAL: S. A. E. NO. 1035; ROCKWELL C37.
 STOCK REMOVED: .025 INCH; .010 ON SHOULDERS.
 WHEEL: 24 INCH DIAMETER; 2 1/2 INCH WIDE.
 WHEEL SPEED: 1030 R. P. M.
 SURFACE SPEED: 74 FEET PER MINUTE.

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The Normal Basis for Corporation Salaries

(Concluded from Page 11)

groups as a whole would remain substantially unchanged.

Seven to Ten Stages Not Uncommon

It should be noted that seven to ten-stage organizations are not uncommon in large-scale American industry—while during the late war the military establishment of the United States ran at least to fifteen stages.

The specific calculations which have been set up for the purposes of illustration make, of course, no pretense to being significant as to all conditions and cases. The relative number of employees in each rank may vary. Certain technical departments may contain a high proportion of well-paid technicians. And many other factors may operate to modify the figures in particular instances. Nevertheless, with all the variations that changes in the basis of calculations may indicate, or that practice may show, the fact still remains that a normal and natural scaling of salaries in large corporations will require rates of compensation substantially in excess of the \$17,500 per annum recently suggested as a maximum for railroad presidents. Furthermore, the evidence is clear that salaries within the normal scale impose no real economic burden, and that the possibilities of waste under even slightly inefficient management are far in excess of any savings which could be effected by the fixing of a

subnormal scale of compensation in the upper ranks.

From the standpoint of national progress, there is no asset so great as the skill of the constructive and professionally-minded technician and executive. Gradually and steadily an increasing number of these have been rising to positions of authority in corporation management. To deny to the leaders of this group a fair measure of the monetary rewards they might hope to find in business or the professions would be the very antithesis of sound economic planning.

TRADE PUBLICATIONS

Bronze Bushings.—Johnson Bronze Co., New Castle, Pa. Bulletins giving standard stock sizes of machine and electric motor bronze bushings and bearings with complete price list.

Automatic Oil Heating.—Wayne Oil Burner Corp., Fort Wayne, Ind. Illustrated booklet showing advantages, construction, and applications of improved Mistoll burner. Units may be adapted to existing heating plants. Simplicity, economy, and safety are principal characteristics advanced by makers.

Iron Pipe.—Republic Steel Corp., Youngstown. Large illustrated catalog presenting technical and physical characteristics, and applications of pipe made of Toncan iron. The pipe is rust-resistant, and will easily cold work and weld.

Steel Bridge Floors.—Carnegie Steel Co., Pittsburgh. Booklet illustrating fabrication, installation, engineering tests, and advantages of T-Tri-Lok, concrete reinforced structural

tee for bridge roadways. The construction is fireproof, and is much lighter than previous floors of comparable strength.

Pyrometers.—Brown Instrument Co., Philadelphia. Folder and catalog No. 1101 presenting records of performance, construction, and characteristics of improved, compact potentiometer pyrometer for all types of temperature control.

Architectural Iron.—American Rolling Mill Co., Middletown, Ohio. Brochure illustrating decorative and architectural applications of porcelain enameled Ingot Iron. Technical and physical characteristics are also included.

Felt-Coated Steel.—American Steel Band Co., Pittsburgh. Descriptive folder describing Felt-Cote, the asbestos, felt covered, steel designed for roof construction and repair. Product is primarily suited for buildings subjected to corrosive fumes. Advantages include low cost, ease of application, and permanence.

Viscosity Control.—Engineering & Sales Co., Inc., Lockport, N. Y. Brief bulletin presenting Meyers-Mesco viscosity regulator for enamel or insulating varnish baths. Precision control over quality and amount of coating is described.

Color Paints.—American Asphalt Paint Co., Chicago. Colorfully illustrated booklet demonstrating corrosion resisting and color applications at the recent World's Fair.

Conveyors.—Mathews Conveyor Co., Ellwood City, Pa. Large book, liberally illustrated, presenting plant installations of all types of conveying apparatus. Equipment is designed primarily for steel and metal working plant requirements.

Controlled Atmosphere Furnaces.—Surface Combustion Corp., Toledo, Ohio. Folder showing extensive line of special furnaces for bright annealing of ferrous and non-ferrous products, for hardening, nitriding, and for gas carburizing. Furnaces are equally suitable for continuous or batch operations, and are intended to replace pickling and sand blasting operations.

Centrifugal Pumps.—De Laval Steam Turbine Co., Trenton, N. J. Reprint of paper outlining developments and present efficiencies of steam turbines and centrifugal pumps for water works pumping.


Plastic Flooring.—Stonhard Co., Philadelphia. Bulletin introducing a new type of floor repair material especially applicable for patching or resurfacing factory floors, trucking aisles, and platforms. The material sets quickly, has a low cost, is applied easily, will not rust, and is resilient.

Electric Bright Annealing.—Pittsburgh Lectromelt Furnace Corp., Pittsburgh. Bulletin describing improved electric controlled atmosphere furnace particularly adapted to the heat treatment of sheets, but suitable for all types of nitriding, cyaniding, carburizing, drawing, and tempering processes. Also presenting a new gas drying apparatus of the activated alumina type.

Electric Flow Meters.—Republic Flow Meters Co., Chicago. Catalog No. 700 introducing improved electric meter for measuring the flow of steam, water, gas, air, or oil for line pressures up to 5000 lb. per sq. in. The instrument has a positive zero setting, and features simple construction and operation.

Turbine Pumps.—Connersville Blower Co., Inc. Bulletin describing applications, design, and operating features of pumps for handling small quantities of liquids at high pressures.

Electrolyte Filtration.—T. Shriver & Co., Harrison, N. J. Booklet presenting an improved unit for thoroughly filtering and clarifying all kinds of electroplating solutions.



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*What kind of metal? how thick?
what size holes? in what pattern?*

The correct answers spell the difference between perforated metal sold as merchandise and that planned the Wickwire Spencer way. The results . . . the metal does better work and has longer life. Our engineers are at your service, free. Let us know the use, we will make recommendations based upon scientific study. It costs no more to buy Perforated Metal in this way.

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60%
PRODUCTION INCREASE
1 1/4" Round, Cold Drawn
J&L Improved Special High
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**BESSEMER
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NO CHANGE IN CHEMISTRY
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20%
LONGER TOOL LIFE
3/4" Hexagon, Cold Drawn
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3/4" Round, Cold Drawn
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33%
PRODUCTION INCREASE
3/4" Round, Cold Drawn
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These production increases resulted from: longer tool life, greater cutting speed or increase in feed, made possible by the radically improved machining quality of J&L Improved Bessemer Screw Steel. Improved appearance, too, was


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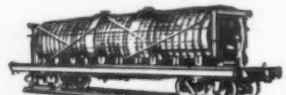
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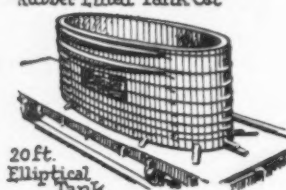
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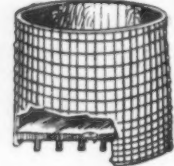
Rubber Lined Storage Tanks




Rubber Lined Tank Car



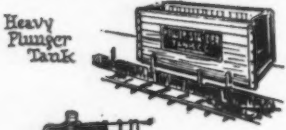
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Rectangular Tank with Water Tight Compartments




Heavy Plunger Tank



Tank Equipped with Self-Contained Agitator



Pressure Tank



40000 Gallon Sprinkler Tank

Write for Catalog!
THE HAUSER-STANDER TANK CO.
CINCINNATI, OHIO

Asks for Guidance in High-Temperature Metal Problems

(Concluded from Page 24)

the advances resulting from high temperature research in other countries. The broadest task of such joint committees is to develop acceptable methods for evaluation of high-temperature properties which industry may use to get the specific data required on specific alloys as new alloys are suggested for high-temperature service, or to appraise the uniformity from lot to lot of older alloys.

The correlation of long duration, research-type test methods and rapid shop or acceptance test methods was one of the original purposes for which the American joint committee was formed and which has had constant consideration in its councils. Until recently, the creep determination itself was hardly on a firm enough foundation to serve as a useful base line for the comparison. Today it seems, while still subject to improvement and still calling for experience and engineering judgment in its application, to be usable as such a base line.

Proposes Industry Conduct Creep Tests

The committee is therefore suggesting that a correlation program should be undertaken wherein, as a minimum, one ferritic and one austenitic steel, each most carefully chosen for metallurgical uniformity and stability, would be subjected to creep determinations, at a temperature in each case chosen in view of the recognized uses for such materials at those temperatures, and at three loads, chosen to produce creep rates of the order considered allowable in industrial use. These creep tests would continue for three years and be made under all the refinements of the A.S.T.M.-A.S.M.E. tentative code.

Meanwhile, the same materials would be subjected to the various accelerated or short-cut methods that have been proposed, and various methods of extrapolation from one load to another that have been suggested, would be applied. From these methods the rate of creep for three years would be predicted according to the procedure used by the proponents of each method, and later compared with the actual results of the three-year test. Material would be held for use in other short-cut methods that may arise later, and for possible international comparisons of methods.

Instead of waiting for comparisons of each short method with regular creep to be made upon whatever materials the experimenter has available, with consequent difficulty of correlation, simultaneous correlation would thus be obtained on the same materials.

Obviously, such a program would involve considerable expense, though the committee already has the promises of many of its own members for cooperation in the program, and the minimum program outlined above could not be started without assurance of sufficient interest and support to make its completion certain. That the American and British joint committees independently laid out three-year programs is evidence that all investigators realize that sustained effort is required for progress.

Question Put to Users and Producers

Designers and users, as well as producers, of alloys for high temperature equipment, such as the power plant, oil, and furnace industries, are therefore invited to inform the secretary of the joint committee, N. L. Mochel, Westinghouse Electric & Mfg. Co., Lester Station, Philadelphia, whether they would like to see such a correlation program taken up by the joint committee. The committee desires to be as responsive to the wishes of the interested engineering industries as the available financial resources will allow.

While its own membership feels that the project outlined should be undertaken at the earliest feasible moment, before committing itself to a "three-year plan," it seeks comment and guidance on the selection of this or alternate activities that may be deemed more pressing by the engineering world. The committee will not assume, in the absence of either adverse or favorable comment that "silence gives consent." Should the program not be sufficiently welcome to the industries concerned so that a definite desire for its pursuit is registered with the committee, the project will not go forward. Comments to Mr. Mochel are therefore earnestly requested, whether pro or con. The comments will be considered at an early meeting of the committee.

Properties of different types of ferrous castings will be discussed at a meeting to be held at the Hotel Statler, Cleveland, Jan. 31. The speakers will be Harry A. Schwartz, National Malleable & Steel Foundry Co., Cleveland; R. A. Bull, Chicago, foundry consultant, and Fred J. Walls, metallurgist, Easton-Erb Foundry Co., Vassar, Mich., covering the malleable iron, steel casting and gray iron industries respectively. The meeting is being sponsored by the American Foundrymen's Association, Cleveland Engineering Society and Cleveland section American Society of Mechanical Engineers.

YOUNGSTOWN

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FORGING STEEL
BOLT NUT and RIVET STEEL
SCREW MACHINE STEEL
HOT ROLLED BARS
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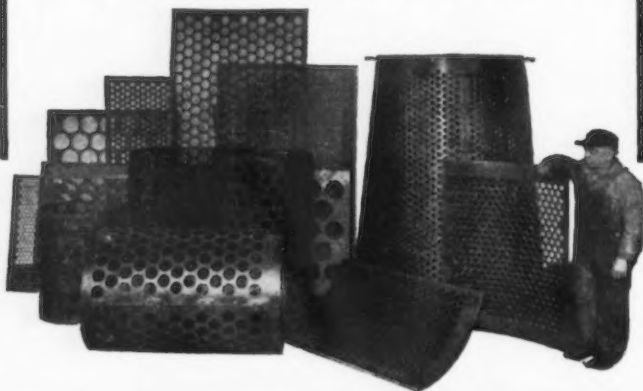
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1/4" SQUARE



1/4" ROUND



1/4" ROUND

A square opening $1\frac{1}{4}$ " will pass oversize material because the diagonal dimension is $1\frac{3}{4}$ ".

A round opening $1\frac{1}{4}$ " diameter (which is equivalent to $1\frac{1}{4}$ " square opening) will give greater accuracy but not sufficient capacity.

"Sground Mesh"—a new Hendrick development—combines the good features of round and square mesh. It eliminates the oversize which goes through the diagonal dimension of a square mesh because the distance between the fillets in the corners of "Sground Mesh" is the same as the diameter of an equivalent round mesh.

"Sground Mesh" can be furnished in any size mesh required, in either flat plates or in double corrugated plate, also a Hendrick development. Write for complete data.

HENDRICK MFG. CO.

37 Dundaff Street Carbondale, Pa.
Baltimore Birmingham Boston
Cincinnati Cleveland Detroit Hazleton
New York Philadelphia Pittsburgh

JUST BETWEEN US TWO

Rising Like the National Debt

THE last half of 1933 blessed us with 1,744 new subscribers, a gain of 84 per cent over the same period of 1932. Danke schön, merci, grazia, and thank you.

If you can stomach another statistic that will be dry to you but 120-proof to us, 78.56 per cent of the readers whose subscriptions expired in the second half of the year have renewed. They have paid us \$6, \$8.50, or \$12 to keep The Iron Age coming to them.

When you consider that even such a stable field as the metal-working industry has a certain turnover, that's a statistic worth gloating over. And what is so satisfying as a good gloat?

This is what is happening to the circulation curve.

"Them As Has 'Em, Wears 'Em"

WHEN Diamond Jim Brady was asked why he loaded his person with pecks of karats of blue whites, he said, "Them as has 'em, wear 'em." When a publication renews an exceptionally high proportion of its subscriptions you can't blame it for not locking the statistic up in a safe deposit box where no one can admire it. For the renewal percentage is the infallible gauge of a publication's worth to its field.

Some run below 30 per cent, meaning that more than two out of every three subscribers say, "We tried your paper for a year and we don't want it any more." When over 78 per cent renew it means that close to four out of every five say, "We like it. Keep it coming."

Subscription renewal percentage is an accurate measure of the reader's opinion of a paper, for although clever salesmanship may sell him the first time, merit alone induces him to renew.

If you ever have occasion to choose between two or more publications in the placing of advertising, take the one that holds the highest proportion of its subscribers, and you'll never go wrong.

Out She Goes!

HAVE you ever observed the signs that herald the going out of ice on a northern river when the chinook begins to blow? Neither have we, but unless Jack London done us wrong, some of the Alaskan sourdoughs can call the turn almost to the hour.

If our frostbitten ears do not deceive us, the freeze-up in advertising is about over. We can hear the ice cracking all over the place. Old advertisers who have been hibernating since 1930 or thereabouts are slowly creeping back, convinced that the rivers of commerce are or soon will be open for safe navigation.

We keep reminding them that you have a short memory and that they better get back now before you forget them altogether. More and more of them are crawling out of their igloos, cautiously stretching their stiff joints, so get set for some full-bosomed issues of The Iron Age.

Bronx Cheers and Laurel Leaves

PICKING out the worst ad in the big book, the Annual Review Number, is a cinch, but picking the best is a tough assignment. Our cherche is the Basic Dolomite insert on pages 219-220. Excellent illustrations, convincing argument, striking layout, and such paper! Until we tore it we thought it was fabric.

To Flint They Flocked

ON Jan. 1 we resolved to stop hiding our light under a bushel. So here goes: The Nov. 30 issue of The Iron Age ("On the Assembly Line") was the first publication to carry the news of Buick's small car. The people who make things that automobile plants need forthwith rushed to Flint and obtained orders, we understand, for over a million dollars' worth of equipment.

Even if you are only a trifle concerned with the vagaries of the motor barons, keep your eye on "On the Assembly Line." It tells things.

—A. H. D.